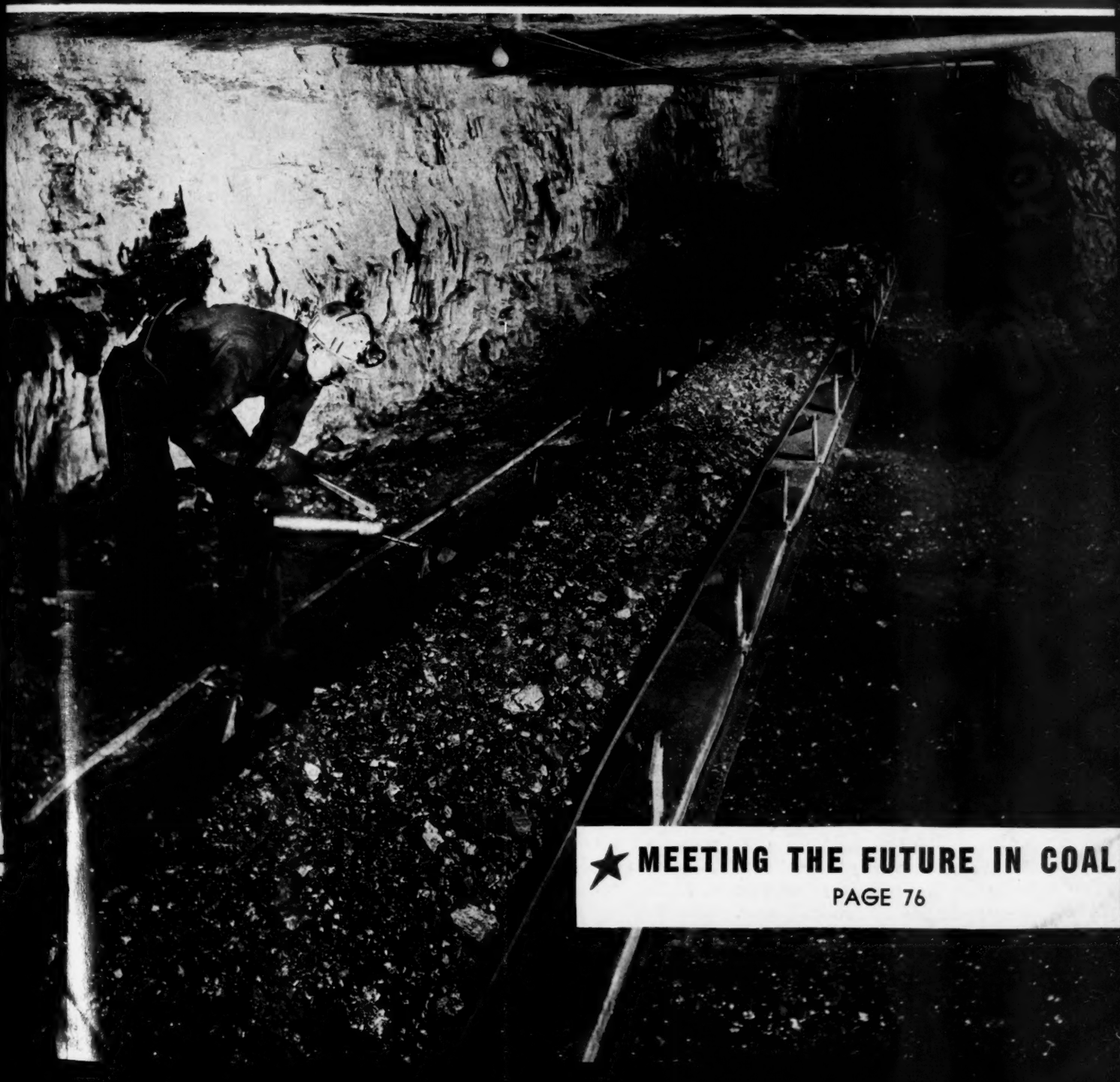
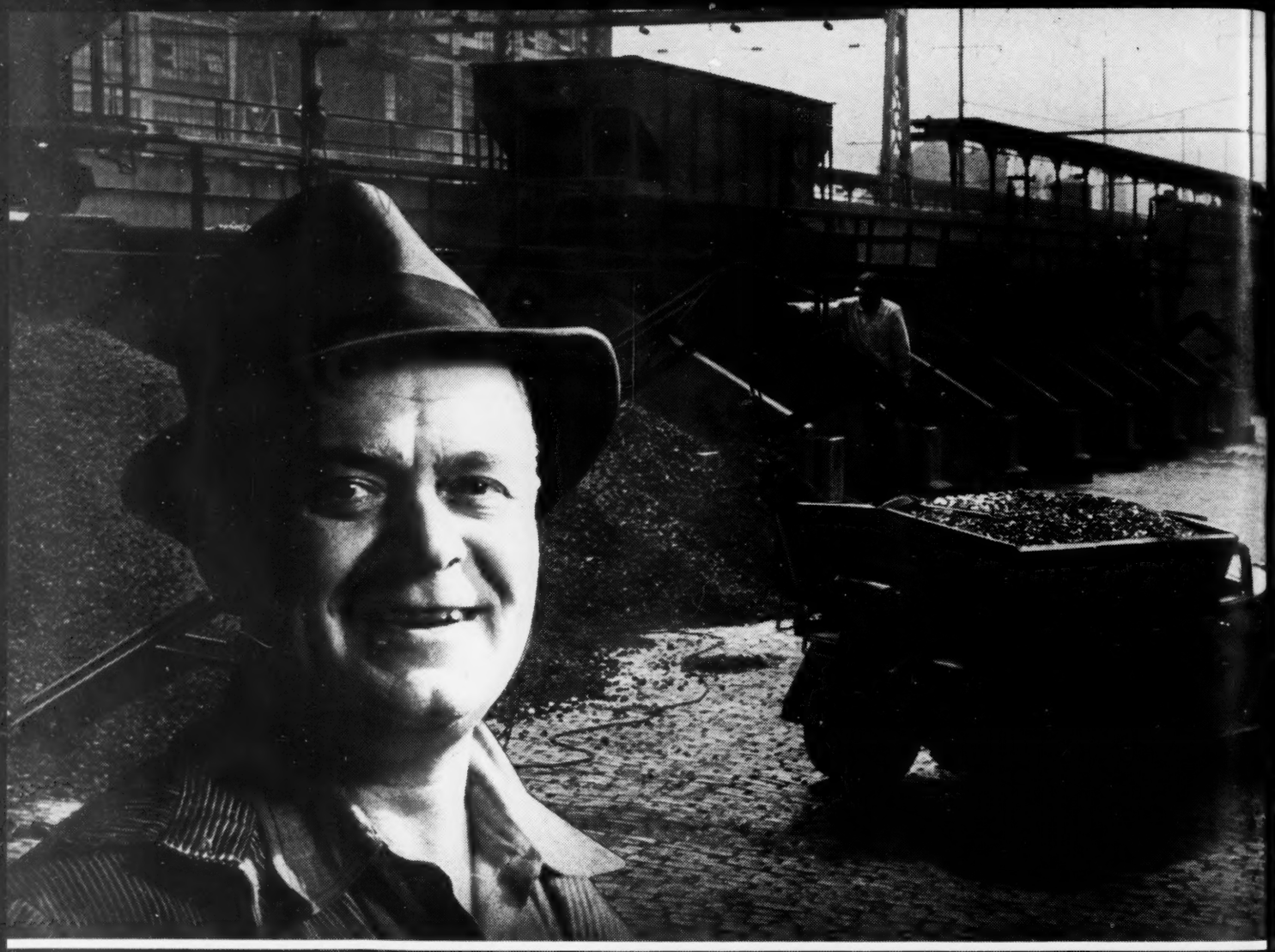
Coal Age

APRIL, 1946



★ **MEETING THE FUTURE IN COAL**

PAGE 76



DUST-PROOFING? *"Yes"* SAY 80% OF DEALERS

COALKOTE's "Sealed Protection"

Holds Down Coal-Dust and Dirt, Meets Dealer Demands for Cleaner Fuel

Five hundred leading coal dealers were asked: "Will it be necessary to market dust-proof and freeze-proof coal?"

Over 80% of the answers (and these included a big proportion of anthracite dealers) said: "YES!"

COALKOTE's "Sealed Protection" puts you in a position to satisfy this overwhelming dealer demand for dust-proofed coal. COALKOTE seals the dust and small particles to the larger pieces, whether of coal, coke, or briquettes.

It's the modern way to treat coal . . . easy to apply. COALKOTE does not corrode loading-equipment, cars, or stokers. It stays effective for a long time. And it's available now.

Provide consumers with the ideal combination . . . clean fuel at a reasonable price. Write for samples and new booklet, "SEALED PROTECTION, an Answer to One of Your Most Important Problems."

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News-Voice of the Air—Lowell Thomas

SUN

SUNOCO

INDUSTRIAL PRODUCTS

A development of

B.F.Goodrich

FIRST IN RUBBER



Rubber fingers move a mountain of milk

A typical example of B. F. Goodrich product development

THE higher the better — that's the way the warehouse operator felt about thousands of cases of evaporated milk that had to be stacked in the warehouse. The higher the stacks, the more goods can be stored in a given floor space.

But the height has always been limited by the stacking equipment. Belt conveyors have long been used. But the smooth surface of the conventional belt would hold boxes only when the incline was slight — too steep a pitch and the boxes slipped down the conveyor.

The company that manufactured the machine in the picture, a "Rapid Power Booster" (T. M. Reg.), came to B. F. Goodrich and found that they had already developed a belt — called Griptop — for handling bags of sugar, that grips the bags with thousands of tiny rubber fingers. A trial belt was installed on a Power Booster and carried cartons up a *35 degree grade.*

Thousands of these belts are in use today, carrying bags, boxes, cartons, baggage, coal, even ice — up grades that couldn't even be attempted with smooth surfaced belts. Like the 35,000 other B. F. Goodrich industrial products, their sole purpose is to increase efficiency and economy for American industry. Ask your B. F. Goodrich supplier for help with any problem that involves the use of rubber. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

First in its Field....



Courtesy of the American Telephone and Telegraph Co.
Woodcut from the Scientific American March 31st, 1877

THE FIRST TELEPHONE MESSAGE

The first telephone message was: "Watson, come here, I want you"... uttered on March 10, 1876, by Alexander Graham Bell to Thomas A. Watson, listening in another room. This demonstration took place in Bell's lodgings at 5 Exeter Place, Boston, Massachusetts. The first outdoor telephone demonstration was on October 9, 1876, over a line two miles long, between Boston and Cambridge, effectively answering skeptics claiming the superiority of the telegraph.

The first and foremost product to answer the coal mine call of "We want QUALITY Grease" was, (and still continues to be) **HULBURT** . . . the **QUALITY GREASE** for Coal Mine Lubrication. The demonstration of its superiority takes place year after year down in the coal mine, where Hulburt Engineers go to study conditions and make recommendations. **HULBURT QUALITY GREASE** is the effective answer to all questions of coal mine lubrication.

HULBURT OIL & GREASE COMPANY — PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

... a record of

American Leadership

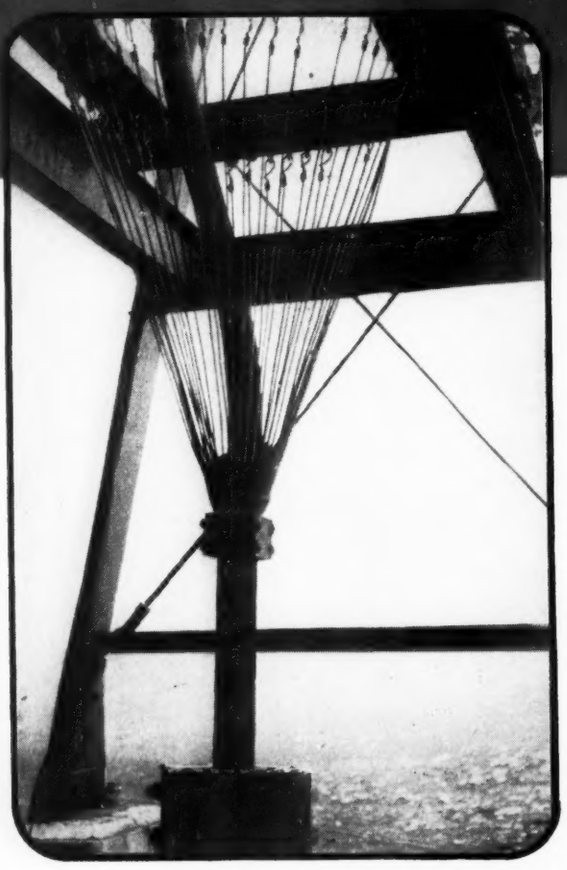


HULBURT

THE "FIRST NAME" IN

Quality GREASE

CUSTOM-BUILT BY HAZARD



BOREHOLE AND MINE POWER CABLES

Just as a piece of machinery, a plane or a car may be custom-built to meet specific needs — so Hazard custom-builds shaft, borehole and mine power cables to produce long, satisfactory service under the specific conditions of each mining installation.

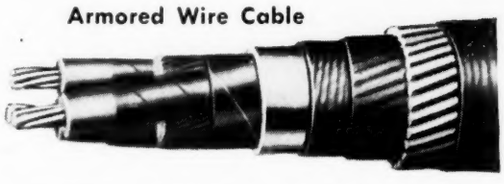
For mechanical protection against falling rock or heavy ice formation encountered in shafts or exposed locations, Hazard builds a type of cable with a sturdy armor of galvanized steel wire.

For comparatively light cables in protected shaft installations or in boreholes, Hazard Spiralweave "firehose" outer cover is usually adequate.

Inside power runs should have the specialized protection of Hazard fungus-resisting, mold-proof Spiralweave covering.

Tell us your cable problems and let us write the specifications for a custom-built cable that can be depended upon for long efficient life on your particular job. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

Armored Wire Cable



Inside construction is basically the same. The Submarine insulation is tough, resilient, moisture-resistant and non-corrosive. Individually taped conductors, waterproofed fillers and tough rubber jacket insure long, satisfactory service.

Spiralweave Cable



HAZARD

insulated wires and cables for every mining use

Coal Age

Alfred M. Staehle, *Publisher*

IVAN A. GIVEN, *Editor*

R. Dawson Hall — J. H. Edwards
Louis C. McCarthy — R. R. Richart
W. A. Stanbury Jr. — W. H. McNeal
Charles H. Lambur

H. Roan, *Art Director*

F. A. Zimmerli, *Associate*

Donald D. Hogate, *Washington*

H. R. Mathias, *Sales Manager*

A McGRAW-HILL PUBLICATION

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address.

Subscription rates: United States, Mexico, Central and South America, $3 for one year, $4 for two years, $5 for three years. Canada, $3 for one year, $5 for two years, $6 for three years. All other countries, $5 for one year, $10 for three years. Single copies, 35 cents each. Entered as second class matter Oct. 14, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U. S. A. Cable Address: "McGraw-Hill N. Y." Member A.B.P. Member A.B.C. Please indicate position and company connection on all subscription orders.

•

Return Postage Guaranteed

Contents Copyright 1946 by McGraw-Hill Publishing Co., Inc.; all rights reserved.

JAMES H. McGRAW
Founder and Honorary Chairman

JAMES H. McGRAW, JR.
President

CURTIS W. McGRAW
Senior Vice President and Treasurer

HOWARD EHRLICH
Vice President
and General Business Manager

EUGENE DUFFIELD
Editorial Assistant to the President

JOSEPH A. GERARDI, Secretary

J. E. BLACKBURN, JR.
Vice President
for circulation operations

Publication office, 99–129 North Broadway, Albany 1, N. Y. Editorial and executive offices, 330 W. 42d St., New York 18, N. Y. Branch offices: 520 North Michigan Ave., Chicago 11; 68 Post St., San Francisco, 4; Aldwych House, Aldwych, London, W.C. 2; Washington, 4; Philadelphia, 2; Cleveland, 15; Detroit, 26; St. Louis, 1; Boston, 16; Atlanta, 3; Los Angeles, 14; 738-9 Oliver Building, Pittsburgh, 22.

All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 99–129 North Broadway, Albany 1, N. Y., or 330 West 42d St., New York 18, N. Y.

District Managers: T. E. Alcorn and F. W. Roets, New York; W. A. Potter, Philadelphia; W. M. Spears, Cleveland; W. S. Drake, Pittsburgh; S. J. Alling, Chicago; C. J. Coash, St. Louis.

CONTENTS

Volume 51 — **APRIL, 1946** — *Number 4*

Meeting the Future in Coal Mining 76

Planned Stripping Helps Modern Units Produce Efficiently 81

Automatic Controls Essential for Conveyor Operation Today. 86
By C. W. THOMPSON

Conveyors, Scrapers Raise Efficiency in Mammoth Mining.. 93
By ELKINS READ and R. R. RICHART

Modern Washeries Culminate T.C.I. Preparation Evolution.... 99
By W. S. SPRINGER and WALLACE J. McROY

Tons Per Man Raised by Machines at Bituminous Mines..... 105
By W. H. YOUNG and R. L. ANDERSON

Track-Dump Valve Passes Rock but Stops Man 118

Axle-Cap Bolts Stay Put 118

High Bridge Promotes Economical Haulage 120

Ramps Facilitate Scraper-to-Conveyor Transfer 122

Fused Nip Box Promotes Safety 124

Pusher Helps in Slate Disposal 124

Wire Guard Protects Timberman 124

Editorials 75

Foremen's Forum ..... 110 — **Questions and Answers...** 114

News Round-Up ..... 127 — **Equipment News** 172

CHANGE OF ADDRESS

Director of Circulation, COAL AGE,
330 West 42d St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

Name .....

Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....



"What?...COAL in Soup?"

CERTAINLY. Companies that make canned soup need more than bare ingredients. They need steam and power. That means COAL—mountains of it. Along with the other food industries they use *more than ten million tons* of Coal each year!

So, in a way, there *is* a lump of Coal in every can of soup, every pound of meat, every box of candy. In the same way, too, there is a lump of Coal in every garment you wear, every piece of furniture you own, every brick and every foot of lumber in your house—a lump of Coal in every pound of steel in your car.

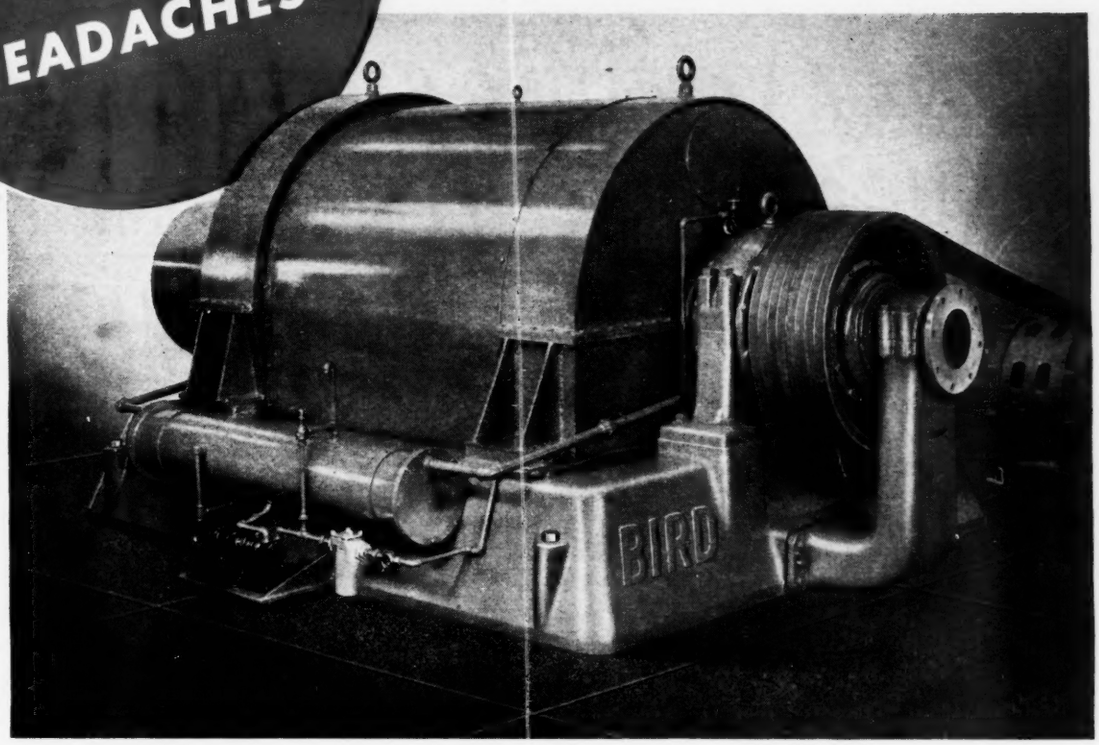
Every year Coal becomes more useful to industry than ever before. Probably no other material is so widely utilized.

Chesapeake and Ohio extensively advertises the usefulness and advantages of Coal—actively participates in all major Coal research projects—is itself one of the largest *users* of Coal. You can be sure that every ton of Coal you ship over any part of the Chesapeake and Ohio System will be hauled exclusively by coal-burning locomotives.

THE CHESAPEAKE AND OHIO RAILWAY

"The 100% Coal Railroad"

NO MAINTENANCE HEADACHES



With this BIRD CENTRIFUGAL FILTER *for* FINE COAL

You just put it in and let 'er run for months without an overhaul. The BIRD is doing it —on coal as well as many other minerals. One machine has run for two years, handling 407,000 tons of rocklike material without a shutdown for maintenance.

The Bird Centrifugal Filter takes out all the water that can be removed mechanically, and does it without screens, filter media or auxiliary equipment. There is minimum breakage of coal. The water leaving the machine is clean. It can be returned for re-use.

The BIRD fits any plant's production needs. Capacity rating per unit is up to 40 tons per hour. Let us mail you Bulletin containing complete information.

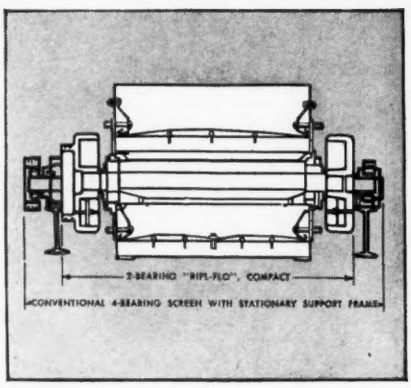
BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

"RIPL-FLO"

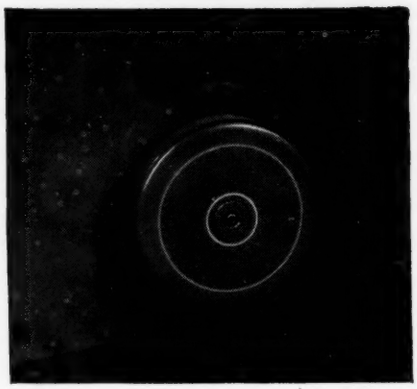
HERE'S A VIBRATING SCREEN, DESIGNED FOR ALL GENERAL APPLICATIONS, THAT'S LOW IN FIRST COST AND MAINTENANCE!



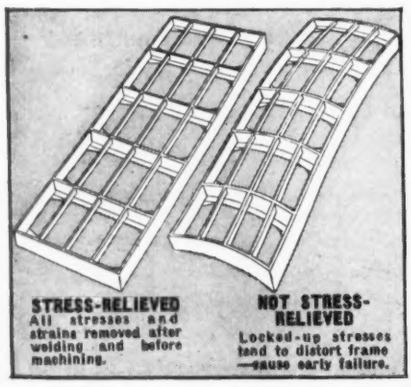
1 2-bearing "Ripl-Flo" *costs less* than any comparable 4-bearing screen, yet it's warranted to do equal or better screening job! Hundreds of these *modern* screens are in use today all over U.S.!



2 Here's one reason A-C can build "Ripl-Flo" for less money, pass savings on to you: Unnecessary outer bearings and stationary support frame are eliminated—reducing width 17%, weight 36%!



3 Balanced mechanism imparts a *perfect circle throw* to every point on screen surface. Result: uniform travel of material; rapid stratification; full capacity; and smooth performance all the way!



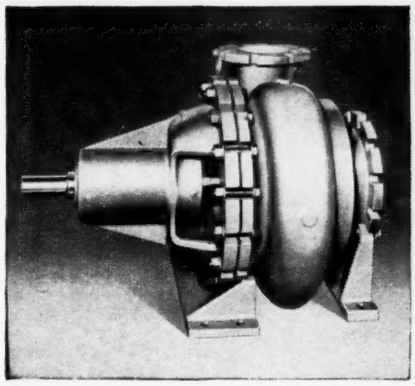
4 Want low maintenance, longer equipment life? All welded parts on "Ripl-Flo" are stress-relieved —eliminating failure adjacent to welds, making entire structure uniformly strong.



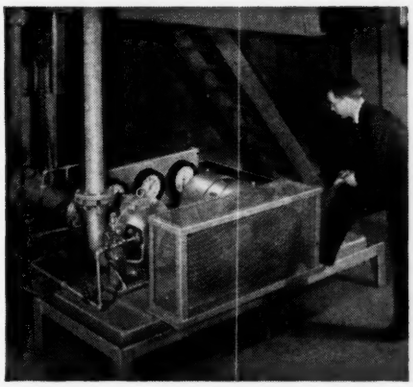
5 Every "Ripl-Flo" screen is shop-tested before it can go out to do a job for you. Operating in a special test rig, it is thoroughly checked for throw, balance, bearing temperatures, etc.



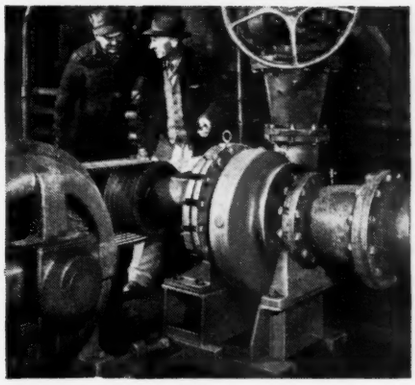
6 Call or write for new "Ripl-Flo" bulletin B6151B today. Contains quick facts as well as detailed specifications about most modern, low-cost screen in U. S.—how it's built, how it operates, etc.



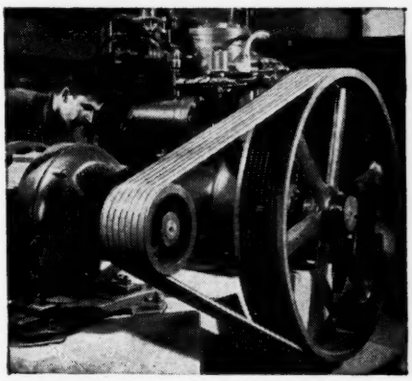
7 Another A-C product that helps lower coal preparation costs is the new Solids-Handling Pump. It is designed for coal-handling, water recirculation and sludge disposal in preparation plants.



8 Combining a *special* design plus a *new,* highly abrasive-resistant alloy, it *outlasts ordinary pumps 2 to 4 times* . . . promises a *lower cost* per ton handled than conventional units of this type.



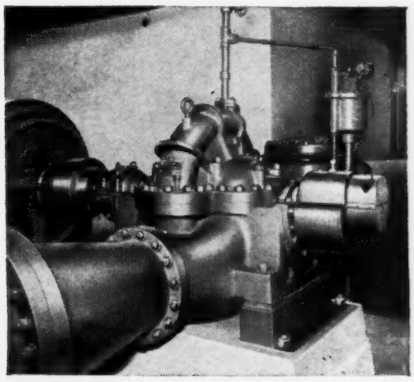
9 Mid-west coal plant uses this 10" x8", 3000 gpm, 70 ft head unit to pump return jig water, 17 to 20% solids, to settling cone. 8 sizes now developed to handle through 7000 gpm. Send for B6381.



10 A-C not only builds basic processing machinery, but motors, controls, Texrope drives needed to run it. That means unit-responsibility—no "buck-passing"!



11 Planning ahead for more efficient power distribution in your plant? This scale model "Unit Substation Builder Set" can help you plan *visually*—saves time!



12 This 2-stage Mine Dewatering Pump, rated 9000 gpm, 360 ft head is typical of A-C pumps for coal. Others in capacities from 10 to 150,000 gpm, heads to 2500 lbs.

ENGINEERING COOPERATION — ANOTHER GREAT A-C PLUS!

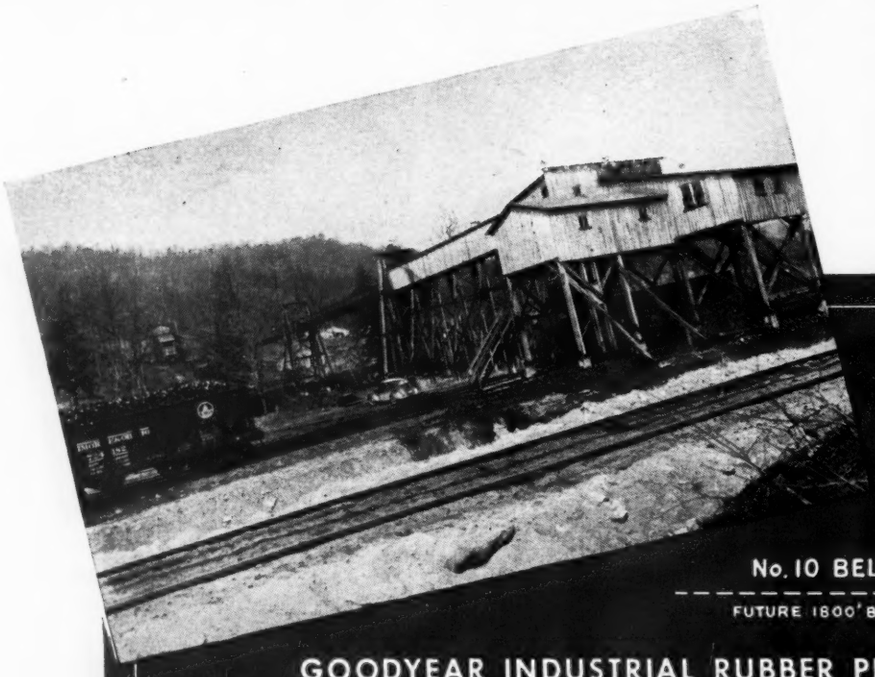
☛ ***Cooperative engineering:*** **A-C engineers, working with your own staff or consultants, help select machinery for your mine, tipple, preparation plant or dock on basis of how it will fit your *entire* process. They look for ways to make *existing* as well as new equipment "team-up" for greater production.** ☛ ***Unbiased Recommendation:*** **A-C builds many types of equipment for coal. When you need screens, for example, you select from *4 different types,* get *exact* equipment you want!** ☛ ***Emergency Parts Service*** **— expediting on urgent repairs. In most cases, parts are shipped right from stock.**

A 1890-B

ALLIS CHALMERS

MILWAUKEE 1, WIS.

Bolair



GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GTM-Specified

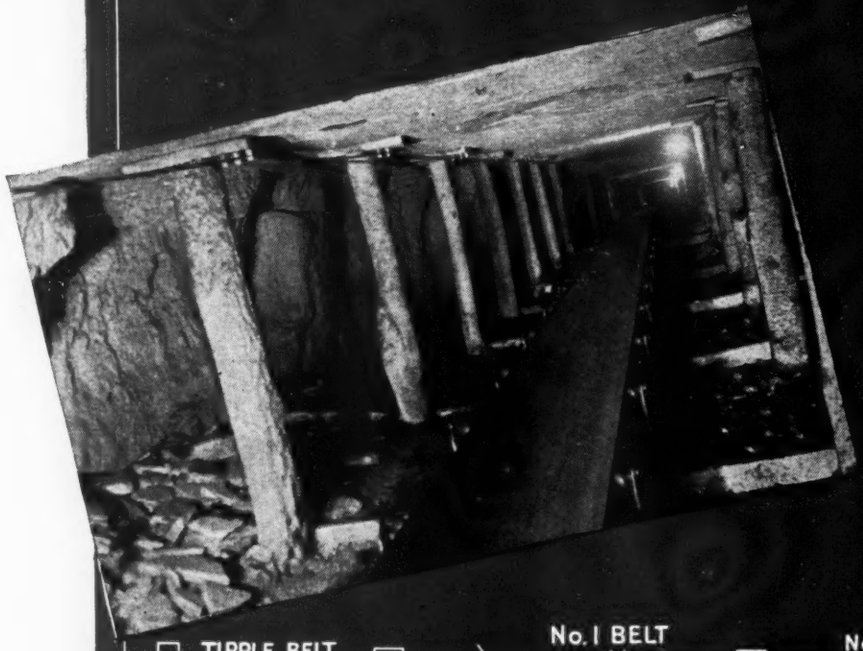
"COAL-FLO" CONVEYOR SYSTEM

for

PARDEE & CURTIN LUMBER CO.

Bolair Mine No. 1

Webster County, West Virginia



Mine ups output 183%

with "Coal-Flo" Belts

ONE of the nation's newest and most modern mines is the completely mechanized Bolair No. 1 in Webster County, West Virginia — producers of the famous Bergoo Sewell Seam Coal. This operation, begun in 1943, was originally planned as a "war baby," with an anticipated yield of 600 tons daily.

However, an unexpected consistency in coal seam height put the mine on a permanent basis. To keep pace with its swift growth, the owners, upon recommendation of the G.T.M. — Goodyear Technical Man — installed a belt conveyor system. Today this comprises a series of 10 Goodyear 30" wide "Coal-Flo" belts, with capacities up to 200 tons per hour. conveyorizing the mine from rooms to tipple.

These belts delivered 317,000 tons in the mine's first full year, and are currently turning out 1,700 tons per day — *183% beyond expectations!* They have performed smoothly and efficiently from the start, without trouble of any kind.

Stalwart Load Carriers

"Coal-Flo" belts have no equal in resistance to cutting and abrasion. They're mildew- and acid-inhibited. Proper troughing indices provide good contact with center idler rolls for easy "training" and good steering — insure maximum loading.

Such exclusive features explain why "Coal-Flo" belts hold world tonnage records for both anthracite and bituminous haulage. The fact is, more than 95% of the hundreds of thousands of feet of Goodyear coal mine belts already installed are still in use—many after 6 to 8 years of service. If you're interested in obtaining such durable, low-cost underground haulage, why not consult the G.T.M. about "Coal-Flo" belts? Write: Goodyear, Akron 16, Ohio or Los Angeles 54, California.

FOR HOSE, BELTING, MOLDED GOODS, PACKING built to the world's highest quality standard, phone your nearest Goodyear Industrial Rubber Products Distributor.

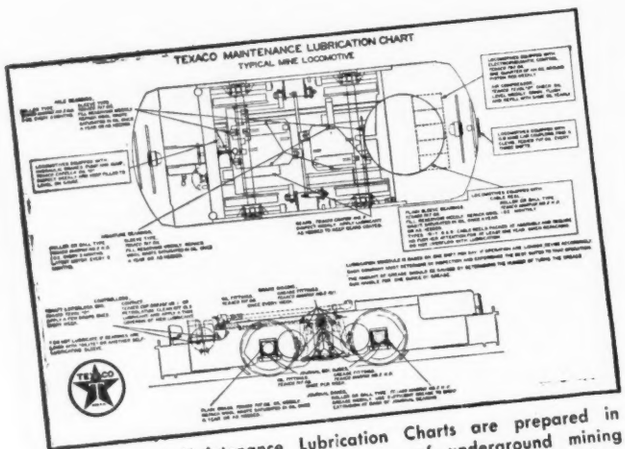
GOODYEAR

THE GREATEST NAME IN RUBBER

"Coal-Flo"—T.M. The Goodyear Tire & Rubber Company

Here's why equipment

TO EXTEND the life of rolling stock and other mining equipment, operators everywhere lubricate heavy-duty bearings — both plain and anti-friction — with *Texaco*. The resulting benefits are smoother operation, fewer repairs and replacements — greater tonnage, reduced maintenance costs.



FREE! Texaco Maintenance Lubrication Charts are prepared in cooperation with leading manufacturers of underground mining machinery who approve Texaco products for use on cutters, loaders, locomotives, etc. Charts show clearly where and when to use the proper Texaco lubricant. Order the charts you need by make and model of each machine.

Texaco *Marfak*, for example, has an extremely tough consistency — is both adhesive and cohesive. It stays in the bearings despite jarring shocks, heavy loads and extremes of temperature, sealing itself in, sealing out dirt and moisture. *Marfak* gives greater protection with fewer applications.

For Texaco Products and Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C*, 135 East 42nd Street, New York 17, N. Y.

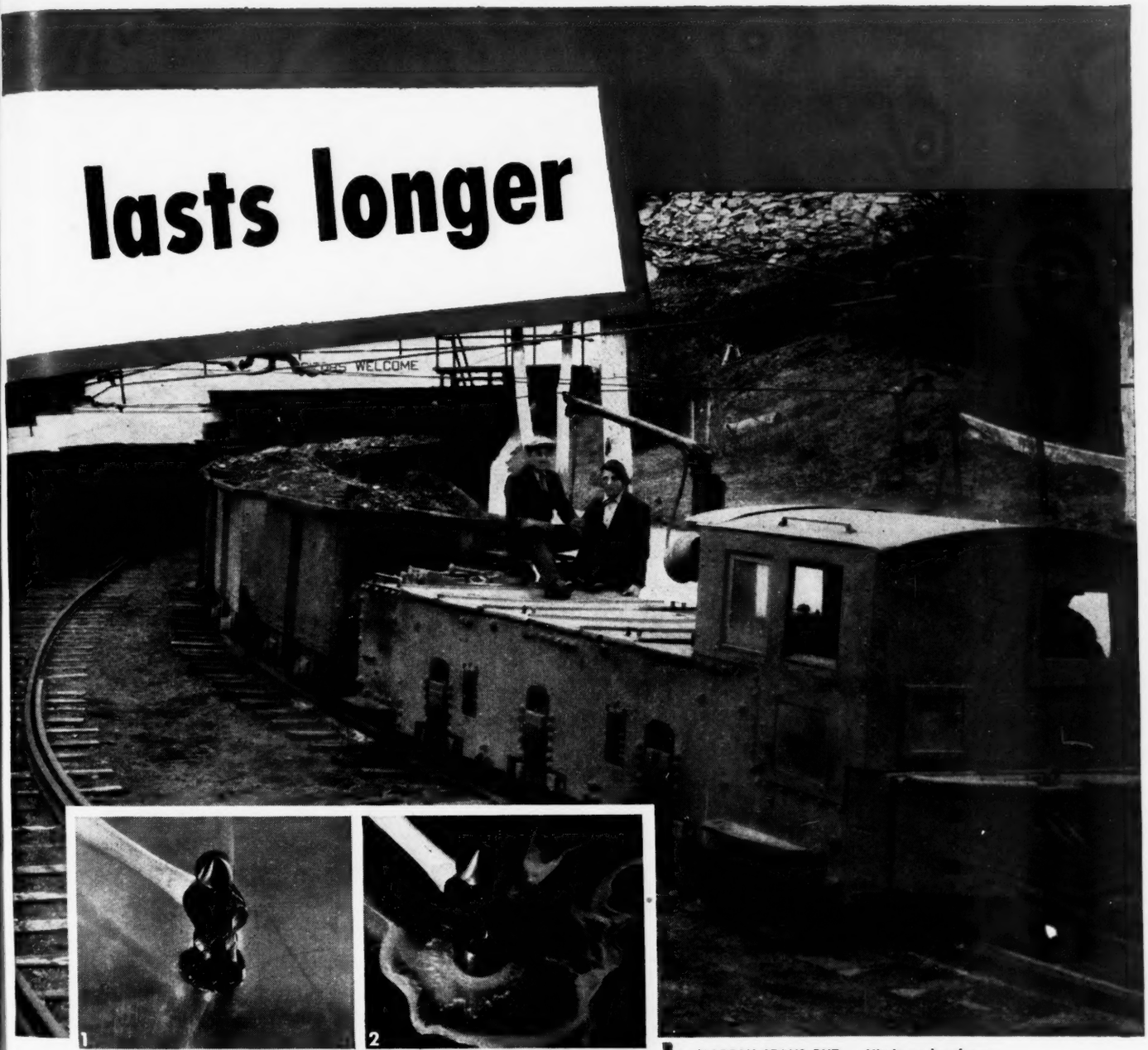
★ ★ ★

Tune in the TEXACO STAR THEATRE every Sunday night starring JAMES MELTON with his guest, ED WYNN—CBS

TEXACO

TEXACO LUBRICANTS

lasts longer







1. MARFAK STAYS PUT — Hit it as hard as you can, Marfak cushions the blow, doesn't splatter — stays in the bearings.

2. GREASE SPLATTERS — Even a light blow sends ordinary lubricant flying in all directions — leaving parts unprotected.

3. MARFAK IS COHESIVE — *Marfak* holds together — stretches. Seals out dirt and moisture — protects parts longer.

4. GREASE SEPARATES — Ordinary grease is not cohesive — permits entrance of dirt and moisture. Fails to protect parts.

For the Coal Mining Industry



Rubs

4 ARRANGEMENTS OF G-E SINGLE-CIRCUIT UNIT SUBSTATIONS



Arranged for overhead incoming and outgoing circuits. Simple, permits high portability.



Incoming circuit is overhead, and an underground cable is used for outgoing circuit.

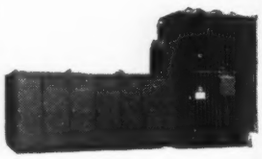


Both incoming and outgoing circuits are underground. Offer full protection from weather.



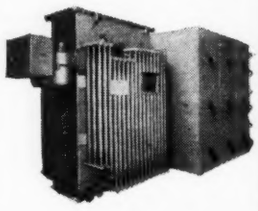
Arranged for both incoming and outgoing circuits to be underground, with a disconnect switch to isolate the unit from the incoming circuit.

There's a G-E Unit Substation for Every Mine and Preparation-plant Requirement



OUTDOOR MASTER UNIT

A complete master unit substation for multifeeder power systems, used instead of the single-circuit unit for operation where more than one feeder or loads above 2600 kva are encountered. Available in sizes from 750 kva to 25,000 kva for primary voltages up to 132,000 volts, and secondary voltages of 2400 to 15,000 volts.



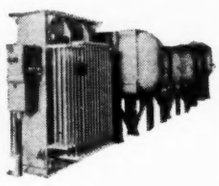
LOAD-CENTER UNIT

A compact substation for use close to 208Y/120- and 480-volt load-center areas supplied from 2400- to 15,000-volt sources. Adaptable to every low-voltage power requirement in preparation and extraction plants. Available in capacities from 100 to 2000 kva, indoor or outdoor.



CONTROL-CENTER UNIT

When it is necessary to supply and control 220- to 440-volt motor branch circuits in a mine conveyor system, for example, this substation can be used safely and effectively. Adaptable to power sources from 2400 to 15,000 volts.

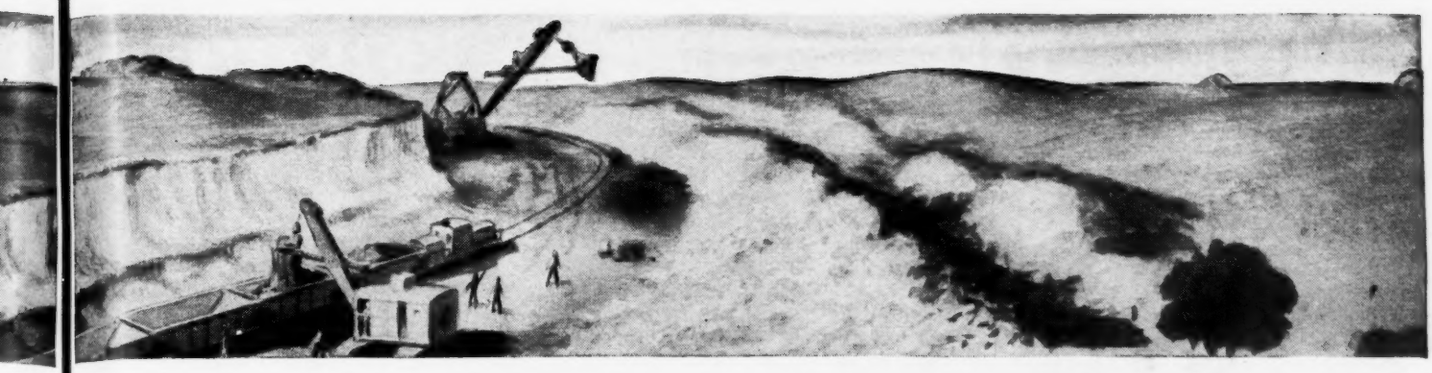


FOR SEMI-HAZARDOUS LOCATIONS

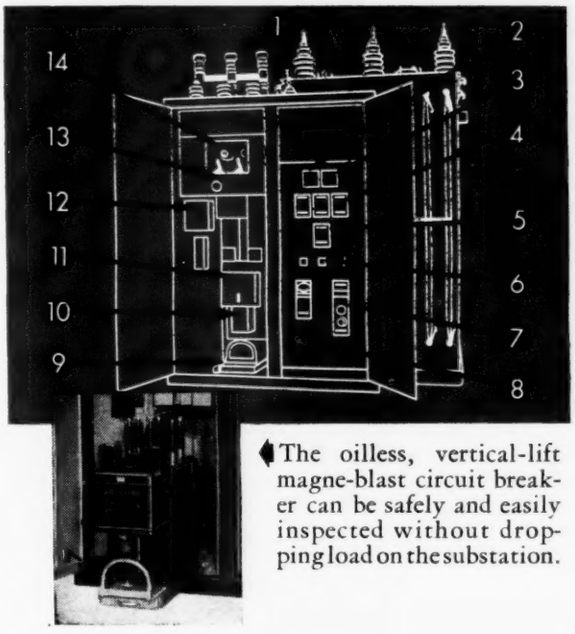
These unit substations feature completely metal-enclosed equipment with explosion-proof enclosures for low-voltage feeder breakers. (Class I, Group D, construction.) Can be used where semihazardous working conditions exist.

GENERAL ELECTRIC

857-48-204



out risk...



The oilless, vertical-lift magne-blast circuit breaker can be safely and easily inspected without dropping load on the substation.

Principal Components of a G-E SINGLE-CIRCUIT, INTEGRAL-TYPE UNIT SUBSTATION

1. Lightning arresters
2. Ammeter
3. Voltmeter
4. Drawout-type, induction overload relays
5. Drawout-type ground relay
6. Breaker control switch
7. Drawout-type reclosing relay
8. Hinged control panel
9. Drawout inspection tray
10. Breaker operating mechanism
11. 5-kv, 50,000-kva, vertical-lift, magne-blast circuit breaker
12. Rectifier for breaker closing
13. Interlocked socket for by-pass switch handle
14. By-pass disconnect switch

This new G-E unit substation protects your operators against fatal shocks from strip-mining machines, yet doesn't "kick out" needlessly.

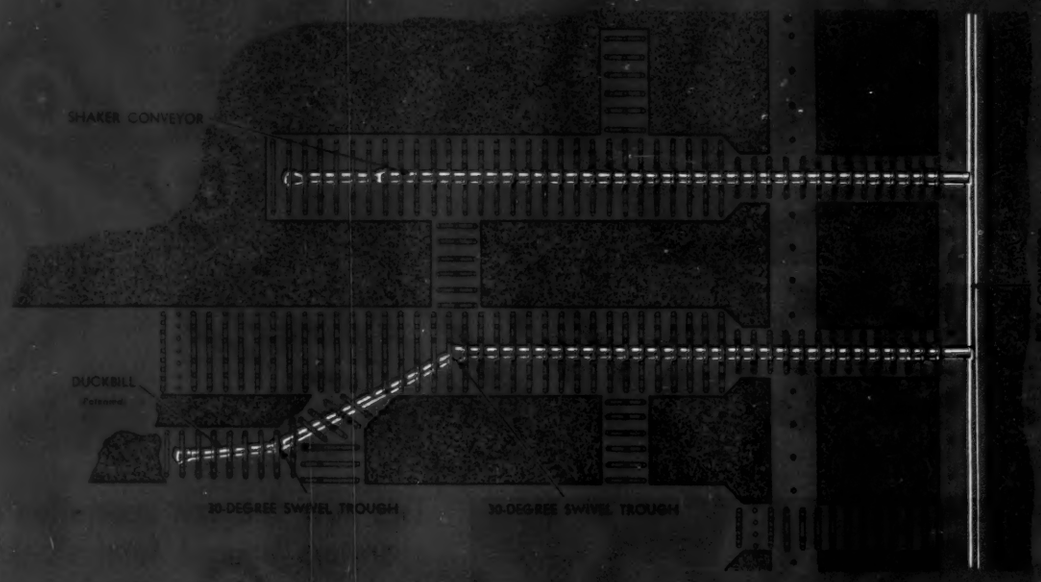
Here's a new integral-type unit substation that's a "natural" for strip mining. It is compact. It is readily portable. Best of all, it can be furnished with highly sensitive relays that detect those dangerous electrical faults which ordinary breakers miss (when stripping shovels and other mining machines are poorly grounded.)

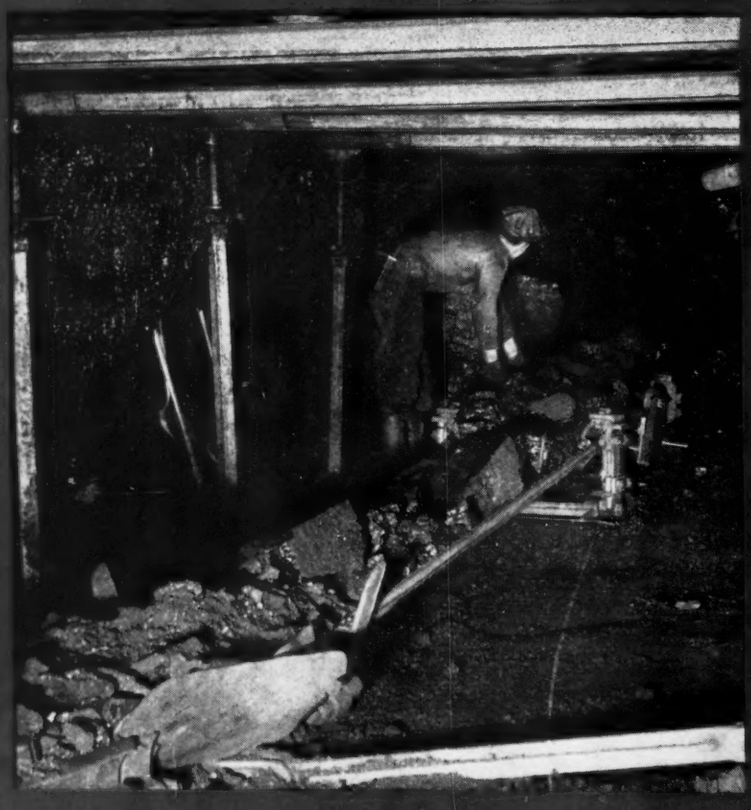
These relays and the grounding system used in this unit substation represent the best protection G-E design engineers know how to give against electrical shock hazards. They are also your best assurance of operating continuity. For this substation is not an "alarmist." Breakers will not kick out because of harmless overloads or faults.

HIGHLY PORTABLE The substation is mounted on a single base. Moving it, as stripping operations advance, is a simple matter. You avoid excessive voltage drops and keep your machines running at full capacity.

For a complete description, write for Bulletin GEA-4300. Whether for strip mining, underground mining, or preparation plants, G.E. has the substation you need. With an eye to lower operating costs in the coming competitive era, it will pay you to review your present power distribution system with a G-E sales engineer. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

THE DUCKBILL-SHAKER





A CONTINUOUS FLOW OF COAL

While the [illegible] out at the [illegible] cutting operation is under way at the [illegible].

GOODMAN MANUFACTURING COMPANY

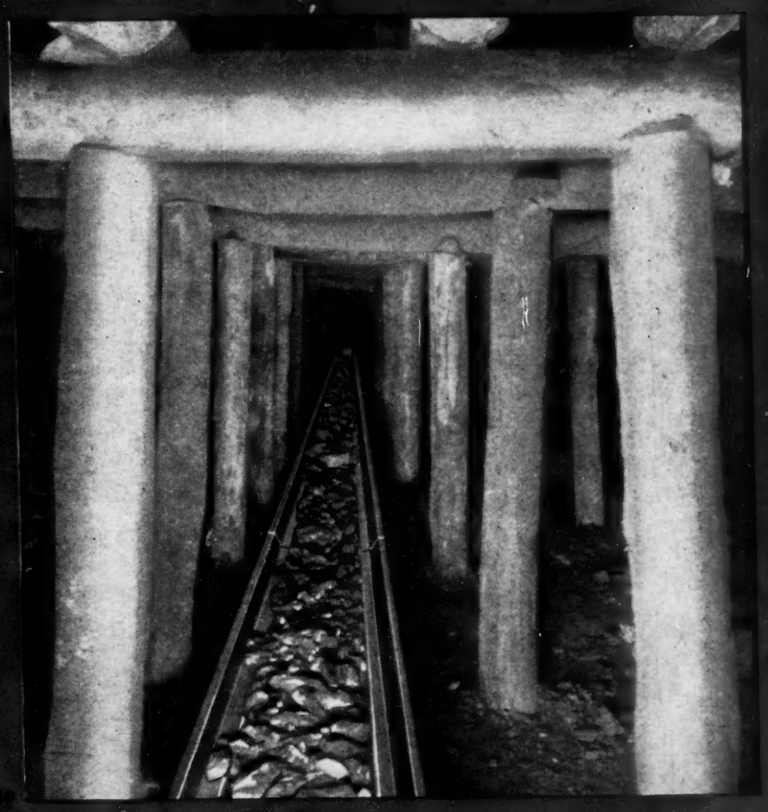
Wilkes-Barre · Pittsburgh · Huntington · Terre Haute

CONVEYOR *System of Mining*

At the installation sketched here Duckbill-Shaker Conveyors in heavy timbering and on pitches up to 15 degrees drive rooms to their maximum depth and recover pillars on retreat without change of setup.

This is just one of many successful applications of Duckbill-Shaker Conveyors. Let us show you a plan to suit your mine.

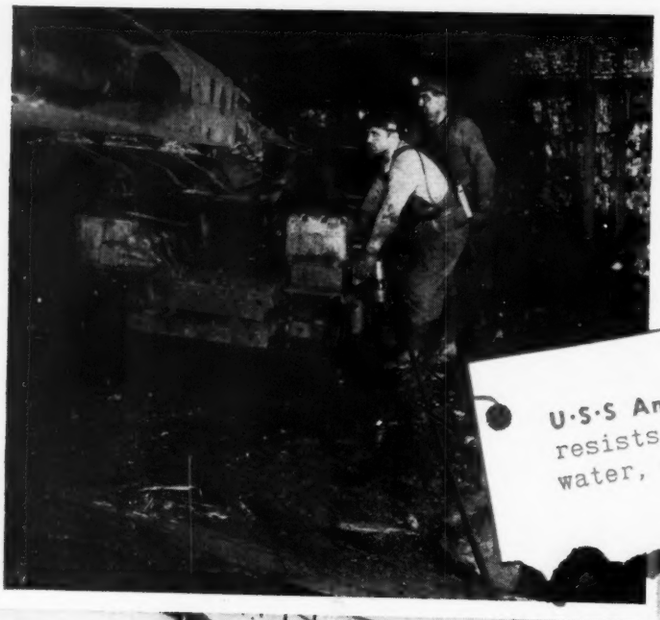
FROM FACE TO MINE CAR



The narrow width of the shaker pan line permits adequate timbering for roof control.

HALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS

Birmingham • Denver • Salt Lake City



Here's why

U·S·S Amerclad on a coal loader resists severe abrasion, acid water, oil and many chemicals.

Power for one of the largest draglines ever built is supplied by this three-conductor U.S.S Amerclad cable especially engineered for the job.

Amerclad stands up
in rugged work

THE tempo of modern mining and construction practices leaves little time for babying any part of your equipment. The average project, which may not be as rugged as any one of those illustrated, usually offers a tough challenge to even the best power cables.

The portable power cable that can stand the grueling grind of being dragged over jagged rocks and abrasive sand, through mud, oil, corrosive acid water, and sometimes run over by heavy machines, pays for itself many times. In carrying power where you want it, when you need it, Amerclad Portable Power Cables enable you to keep your project going when delay caused by replacements and repairs might eat deeply into project profits.

U·S·S AMERCLAD Portable Power Cables have tough hides. "Rubber-armored", they're frequently called. And they deserve that title, for their protective sheath of tough, resilient, "Tire-tread" oil and sun resisting Neoprene provides important advantages that metallic armor does not. Its light weight, its flexibility, its waterproof properties, and its resistance to abrasive wear assure long service life.

Whatever the job, you'll be able to do it better with Amerclad Portable Power Cables. They're obtainable for low or high voltage operation, in every needed size and type. Write for our booklet "Amerclad Cords and Cables". It will save you time and money.



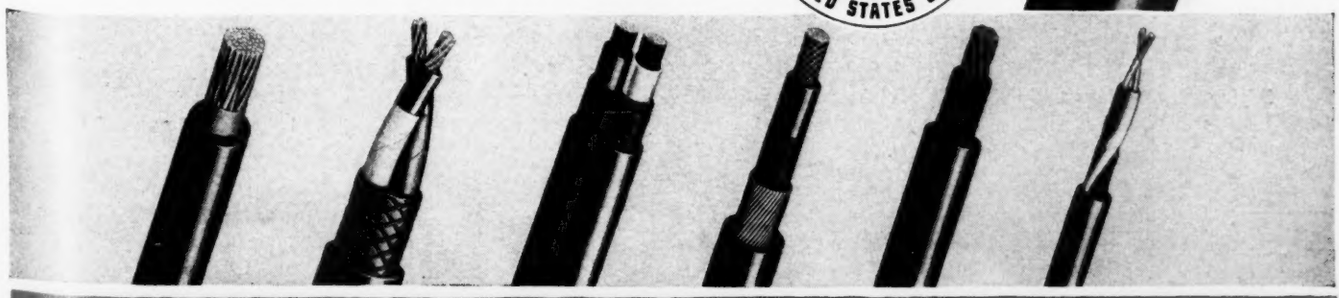
AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

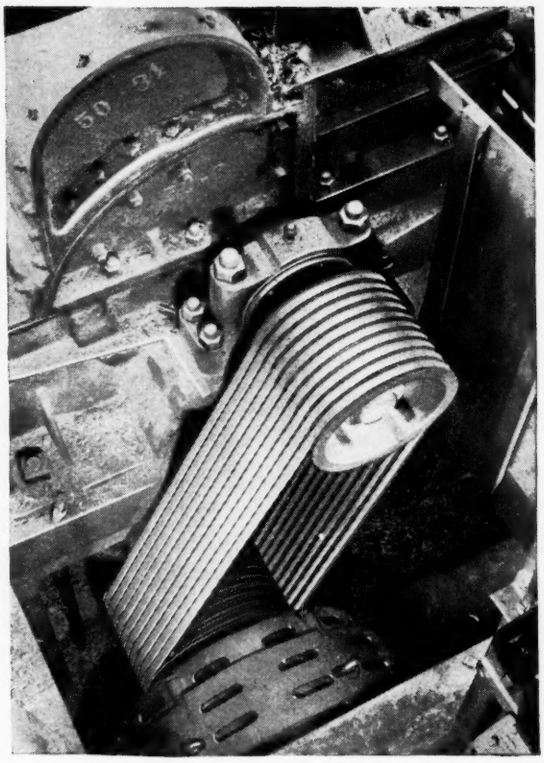


U·S·S AMERCLAD CABLE

The Reason for this Fact is worth knowing

Your GATES VULCO ROPES are Today Making Performance Records NEVER EQUALED Before!

No V-belts built by *anyone* before the war had anywhere near the strength and durability that was found necessary on U. S. Army tanks, tractors and self-propelled big guns in combat service. Gates developed these greatly superior V-belts for Army use—and here is why this fact is important to industrial users of V-belts:—



Here is the reason

Every improvement developed by Gates for U. S. Combat Units — and many later improvements, also—have been added, day by day, to the quality of the Standard Gates Vulco Ropes which have been delivered to you.

That is why, *long before the war was over,* you were getting in your Standard Gates Vulco Ropes a product built to far higher service standards than any V-belts ever built by anyone before the war.

And that is not all of the story. Through continuing *specialized* research, the service qualities of these superior Gates Vulco Ropes have been still further improved as all of Gates facilities and energies have been returned to the service of industry.

These are the simple reasons why the standard Gates Vulco Ropes you are getting today are far and away the best V-belts Gates has ever delivered to you.

All Gates V-Belts are Built with *The Patented* CONCAVE SIDE



THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

Gates

THE MARK OF SPECIALIZED RESEARCH

464

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL., 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue. ATLANTA 3, GA., 521 C. & S. Nat'l Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway. DETROIT 2, MICH. 223 Boulevard Bldg.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL., 170 Ninth St.



THE RI

vic

● Jeffrey builds a complete line of Underground chain and belt type conveyors in various sizes to meet tonnage requirements for conveying coal from face to tipple. Designs are based on years of experience and contact with actual underground operations.

Jeffrey maintains a competent staff of engineers and service men to help you . . . they are specialists in underground conveyor mining.

RIGHT TICKET

FOR

Continuous Performance via Jeffrey Underground Conveyors



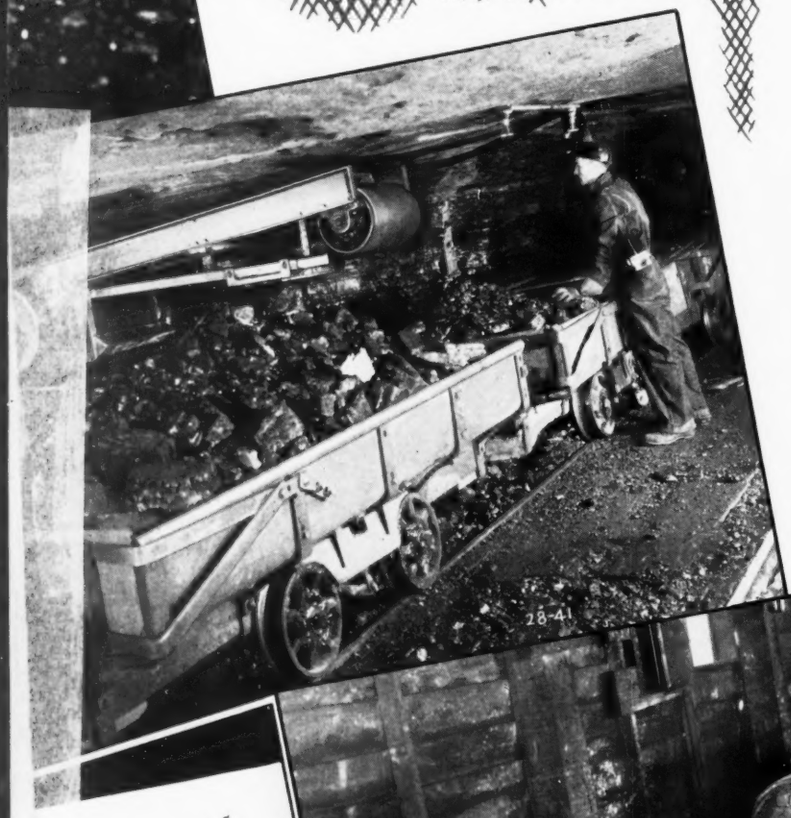
FROM FACE

TO BUTT HEADING

TO MAIN HEADING

OR

TO TIPPLE









DID YOU KNOW?

THAT AMONG THE MANY IMPORTANT PRODUCTS DEVELOPED FOR MILITARY USE DURING THE WAR IS A SHATTER-PROOF MARINE INSTRUMENT PANEL MADE BY COATING A FIBERGLASS FABRIC WITH A COAL-DERIVED PLASTIC?

THAT THE PATENTED DIVERGING HEAD

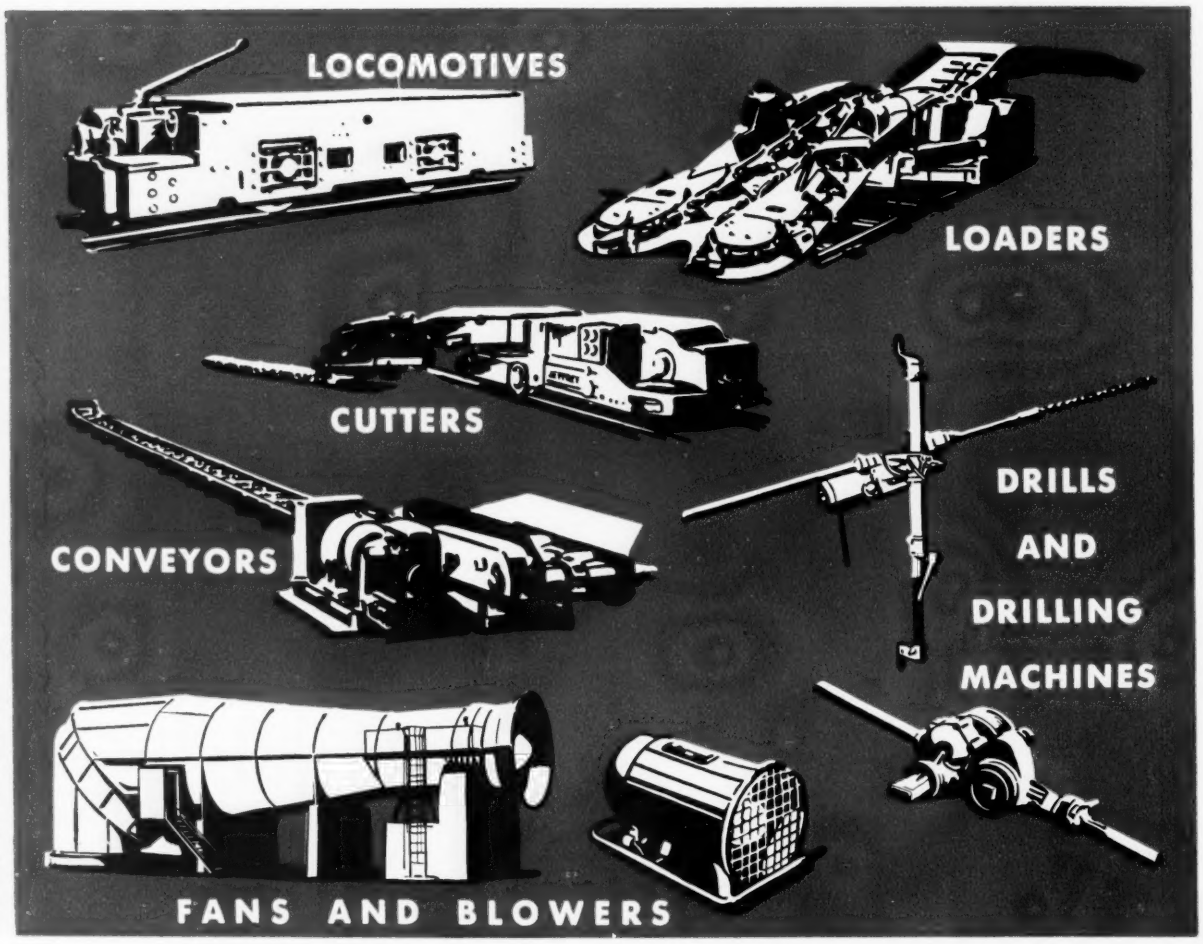
IS AN EXCLUSIVE FEATURE ON JEFFREY CHAIN CONVEYORS?



Jeffrey

EQUIPMENT FOR COAL MINES

JEFFREY SERVICE TO THE COAL MINES
MEANS SERVICE TO ALL INDUSTRY



THE JEFFREY MANUFACTURING COMPANY

Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

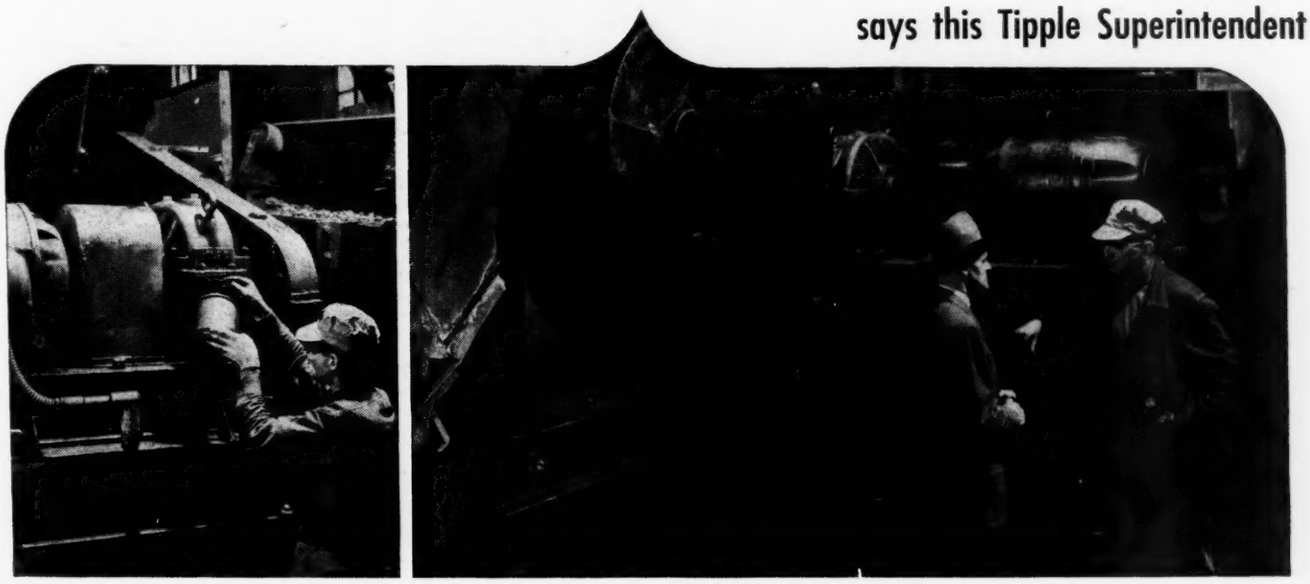
Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty), Ltd., Johannesburg, S. A.

"with Gulf E. P. Lubricants we eliminated foaming troubles, removed an accident hazard"

says this Tipple Superintendent



(Above) Actual photo of a Tipple Superintendent consulting with a Gulf Service Engineer on the lubrication of reduction gears. (Left) Applying the proper grade of Gulf E.P. Lubricants to a reduction gear unit.

"FOAMING of the lubricant we formerly used on our reduction gears resulted in faulty lubrication, slippery floors, and production time lost for cleaning up," says this Tipple Superintendent. "Non-foaming Gulf E.P. Lubricants completely ended these troubles. The Gulf Lubrication Service Engineer gave us the right answer to a serious problem."

Gulf E.P. Lubricants are of the lead naphthenate type, recognized as superior to other types in performance, effectiveness, stability, and lubricating value. Gulf E.P. Lubricants are tenacious, extremely stable, separate readily from water, have a high viscosity index, are noncorrosive and nonfoaming. They are manufactured in a wide range of consistencies to meet your every requirement.

Call in a Gulf Service Engineer today and ask him to demonstrate how these superior lubricants can help you get trouble-free service from your reduction gears and lower maintenance costs. Or send the coupon below for further information.

Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta · New Orleans · Houston · Louisville · Toledo

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation · Gulf Refining Company CA
3800 Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, complete information on Gulf E.P. Lubricants.

Name.....
Company.....
Title.....
Address.....

O.M.C. says:

(OLD MAN COMPETITION)



The right wire rope can help you keep production up – costs down!

SUCCESSFUL BUSINESS OPERATION in the face of growing competition from other fuels, will force utmost economy in coal production costs.

To maintain stepped-up production profitably, equipment has to be *good*. In this competitive picture there is no room for costly shutdowns and expensive maintenance jobs.

Wire rope, too, can do its part . . . by giving trouble-free performance. Roebling "Blue Center" Steel Wire Rope is built for the most gruelling of heavy-duty mining operations. It will fight abrasion and fatigue . . . combining flexibility and strength for long, economical service.

This tough, famous "Blue Center" rope comes from the plants of America's *first* wire rope maker. Call Roebling . . . an experienced engineer will help you choose the *right* rope for the job, for maximum service!

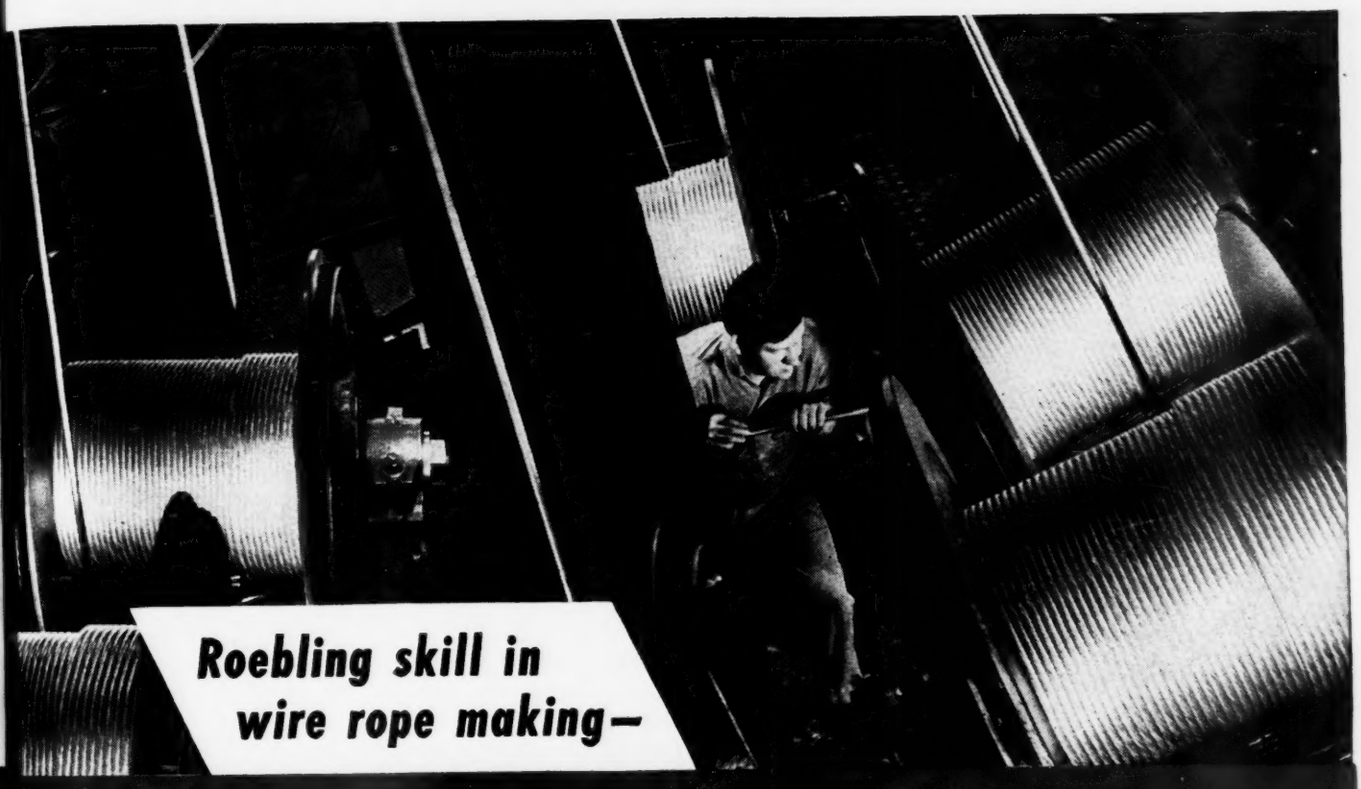
JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

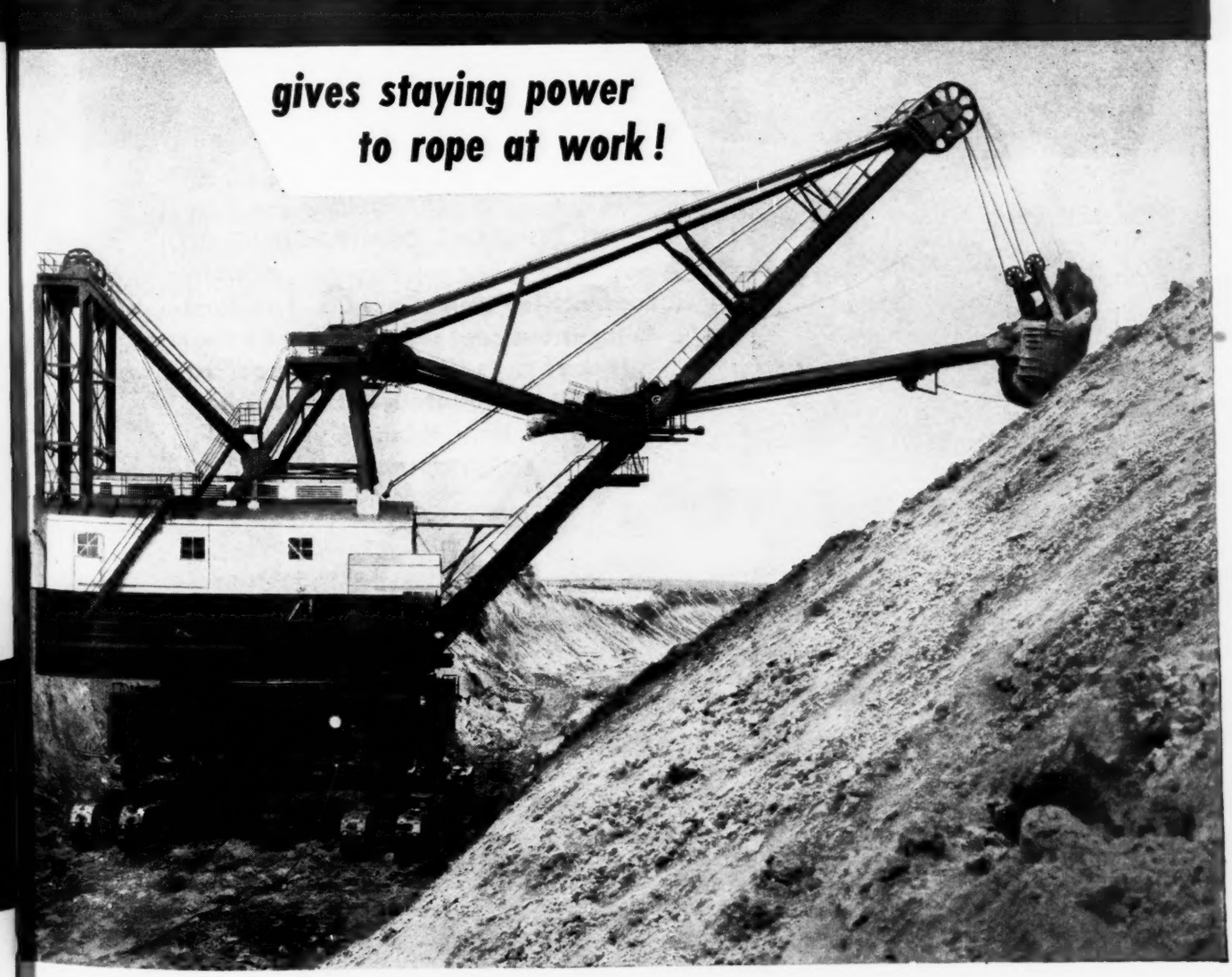


WIRE ROPE AND STRAND • FITTINGS • SLINGS • AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • COLD ROLLED STRIP • ROUND AND SHAPED WIRE • WIRE CLOTH AND NETTING • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS SUSPENSION BRIDGES AND CABLES • ELECTRICAL WIRES AND CABLES • AERIAL WIRE ROPE SYSTEMS

ROEBLING

PACEMAKER IN WIRE PRODUCTS


Roebling skill in
wire rope making—


gives staying power
to rope at work!









5 MARIONS

Help H. J. Williams Contracting Co. Make Short Work of its Present Coal Stripping Contract

Removing top soil . . . digging away shot rock . . . loading out the 4'6" seam of coal . . . all in record time . . . is the job of 5 MARIONS owned by H. J. WILLIAMS CONTRACTING CO., and kept busy on its coal stripping contract for Helm Coal Co. The semi-bituminous coal seam, under 48 feet of cover, is located on top of Broadtop Mountain in Huntingdon County, Pa. ***What is your coal stripping problem?***

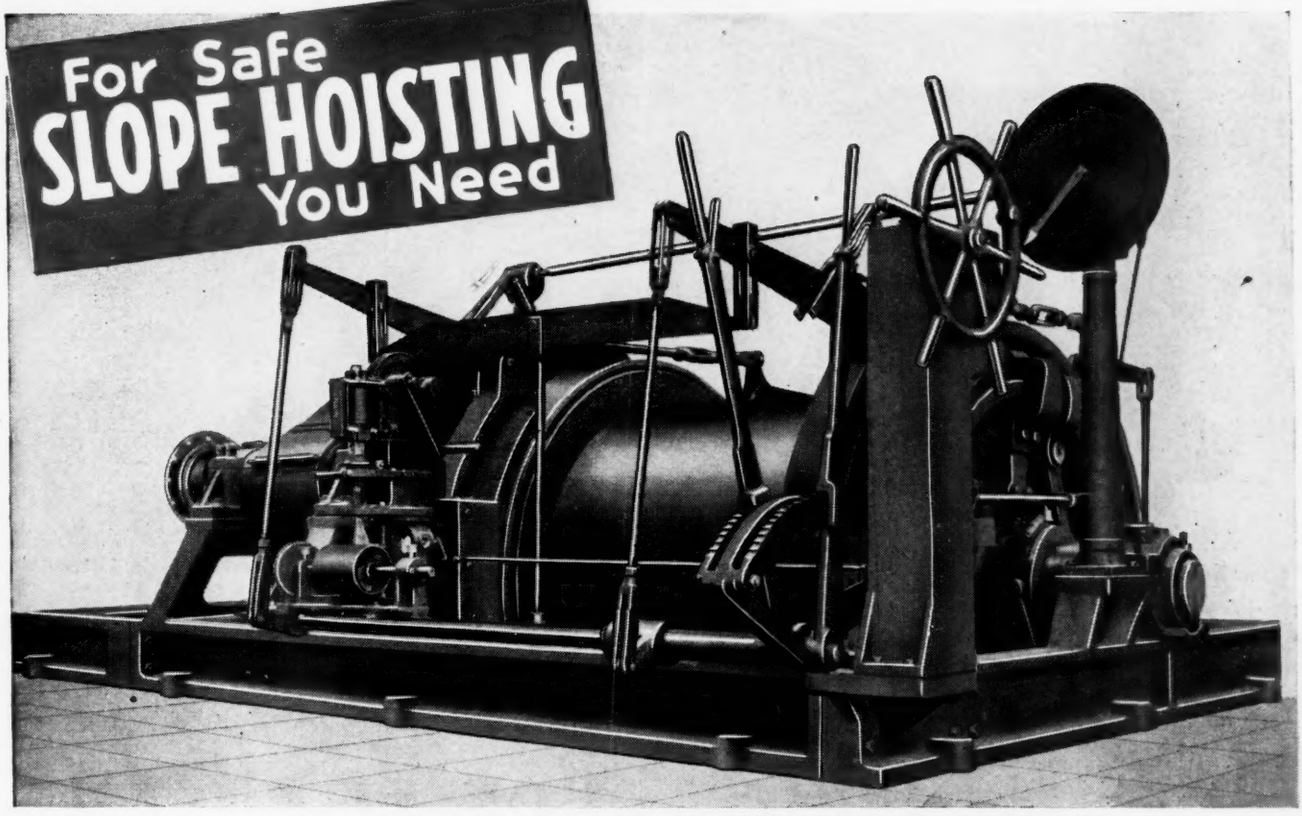


THE MARION STEAM SHOVEL COMPANY

Marion, Ohio

Offices and Warehouses in All Principal Cities

3/4 cu. yd. to 40 cu. yds.



. . the Vulcan Delayed-Action Safety Device

Experienced mining men know how desirable it is that automatic application of the brakes on a slope-hoist drum should be delayed until the upward momentum of the trip has stopped and it begins to move back. Accumulation of slack is thereby prevented—eliminating danger of over-running the rope, or of breaking it if the trip falls back rapidly enough to take up the slack with a sudden jerk.

The Vulcan Delayed-Action Safety Device supplements the well-known Vulcan Dead-Weight Safety Device so that—when the electric power fails, or is cut off by action of either the overspeed governor or the travel-limit control—the magnet plunger falls only a fraction of an inch before coming to rest on a small revolving drum. This drum is chain geared so that its rotation is synchronized with that of the hoist drum, and the magnet plunger is so hinged that it cannot complete its fall while the small drum is revolving toward it. When the drum has turned back a quarter of a revolution, however, the magnet plunger does complete its fall; thereby loosening the latch which supports the heavy "dead weight" and automatically applying the brakes.

As indicated by the illustration above most new Vulcan slope hoists are now equipped with this device but our engineers also welcome opportunities to promote safer operation by submitting plans and specifications for its application to slope hoists already in service.

NOTE: Illustration above shows the Delayed-Action Safety Device applied to a 350 hp. Vulcan Slope Hoist with hand-operated brakes. It is equally applicable, however, to our larger hoists having brake engines operated by either air or oil-hydraulic pressure systems.

VULCAN IRON WORKS

Established 1849

Main Office and Works **WILKES-BARRE, PA.,** New York Office 50 Church

Heavy-Duty Electric Hoists
Self-Contained Hoists
Scraper Hoists
Car-Spotting Hoists
Room Hoists

Shaking-Chute Conveyors
Chain Conveyors
Cast-Steel Sheaves and Gears
Cages, Skips and Gunboats
Coal-Preparation Equipment

Steam Locomotives
Diesel Locomotives
geared and electric drive
Gasoline Locomotives
geared and electric drive

Load-Carrying Larries
Rotary Kilns, Coolers and Dryers
Crushing Rolls and Pulverizers
Briquetting Machines
Ball, Rod and Tube Mills



Specification for

LONG TRUCK LIFE
LOW OPERATING COST



1. Go to your International Branch or Truck Dealer and say, "These are my loads. These are my routes. I want a truck that is strong enough and big enough to do my work."

2. Accept the recommendation you get. Here's why: The International Truck Line is complete. It includes a truck of the right type and carrying capacity for every job. International Branches and Dealers can recommend the right trucks without prejudice.

3. Set up a program of regular International service. The work is done by skilled mechanics, using special International equipment and factory-standard International parts. The service is supplied by International Dealers everywhere and by the nation's largest company-owned truck-service organization—International Branches.

Today's International Trucks are the best ever built. They represent more than 40 years of truck engineering and manufacturing experience. This engineering and manufacturing has long been so outstanding that in the last 15 years more heavy-duty Internationals have been purchased for civilian use than any other make.

So buy International—service International—and don't "under truck." That's the specification for long truck life and low operating cost.

Motor Truck Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

LISTEN TO "HARVEST OF STARS" EVERY SUNDAY! NBC NETWORK

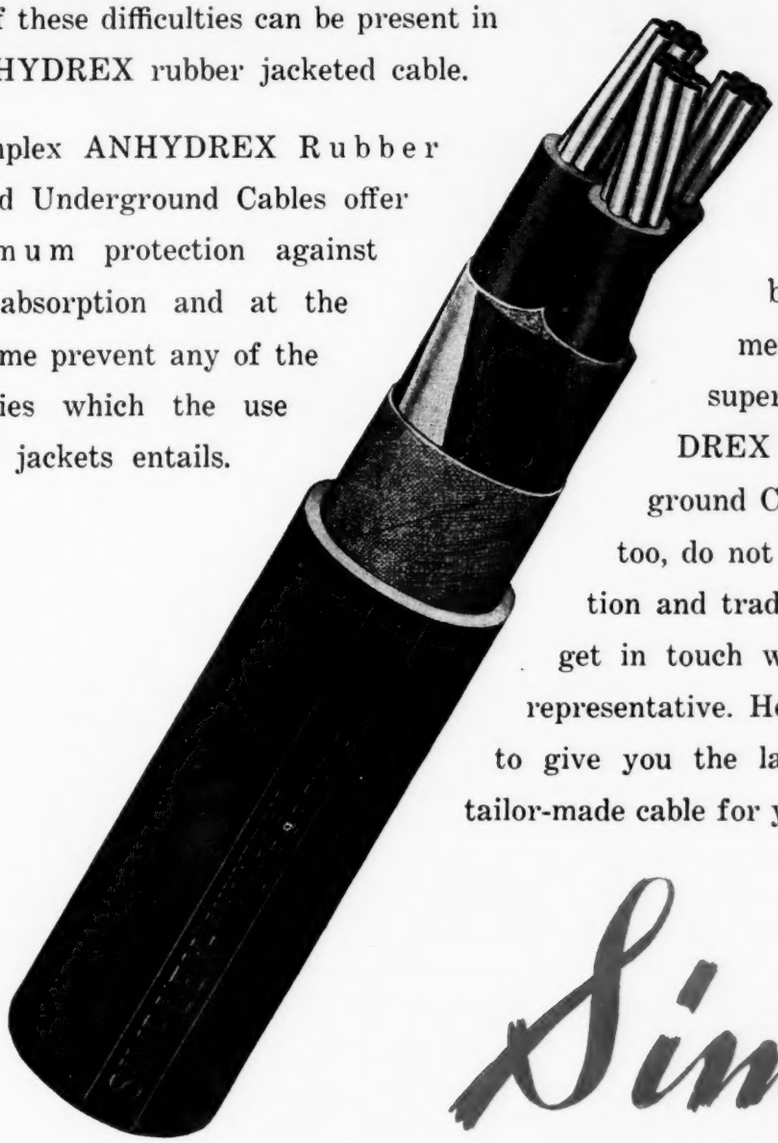
INTERNATIONAL

INTERNATIONAL *Trucks*

ANHYDREX *Eliminates* LEAD SHEATH.... *Troubles*

The elimination of lead sheaths in underground cables does away with a whole series of difficulties such as crystallization, sheath currents. corrosion and electrolysis. None of these difficulties can be present in an ANHYDREX rubber jacketed cable.

Simplex ANHYDREX Rubber Jacketed Underground Cables offer maximum protection against water absorption and at the same time prevent any of the difficulties which the use of lead jackets entails.



Up - to - the - minute cable users who are abreast of modern developments have recognized the superiority of Simplex ANHYDREX Rubber Jacketed Underground Cables. If you feel that you, too, do not need to be tied to convention and tradition, we suggest that you get in touch with your nearest Simplex representative. He will be more than happy to give you the latest information about a tailor-made cable for your particular installation.

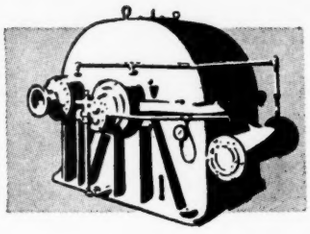
Simplex

WIRES AND CABLES

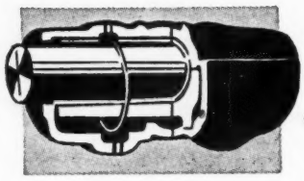
SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

Improved STANOILS

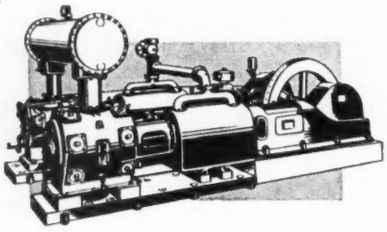
...last longer in gear cases



...in bearings



...in compressors



...and hydraulic systems

STANOILS have long been outstanding for relative freedom from deposit formation, and for their long lasting quality in all types of service. Now by the addition of an oxidation inhibitor, developed by Standard Oil, the oxidation stability of Stanoils has been improved many-fold.

With improved Stanoils, oil acidity will remain at a safe low figure for long periods of operation. At the same time, deposit formation is practically eliminated. In addition, an effective defoaming agent is used.

These advantages can be secured for a variety of applications, because improved Stanoils are available in a wide range of viscosity grades. In fact, you may find that Stanoils can be applied to all your lubricating jobs, with consequent simplification of ordering and stocking.

A Standard Oil Lubrication Engineer will be glad to help you test improved Stanoil and point out equipment in your plant in which the high stability and clean operation of Stanoil can save maintenance time and money. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

CARDOX

(NON-EXPLOSIVE MINING METHOD)

Protects Property as well as Profits

IN CASE OF FIRE USE CARDOX



1. SECURE WRENCH FROM MOTORMAN OR CARDOX RACK.
2. INSERT WRENCH IN SHELL AS SHOWN AT LEFT.
3. OPEN VALVE BY STRIKING WRENCH WITH PALM OF HAND.
4. POINT VALVE AT FIRE. ALLOW TO FLOW ONTO BLAZE AS SHOWN AT RIGHT.
5. THROW SHELL INTO FIRE IF IT CANNOT BE APPROACHED.
6. USE AS MANY SHELLS AS NECESSARY.

IMPORTANT:

1. NOTIFY FOREMAN AT ONCE!
2. DO NOT ALLOW SHELL TO TOUCH ELECTRIC WIRES!
3. RETURN KEYS TO MOTORMAN OR CARDOX RACK!



HELP PREVENT FIRES



You will find this placard posted in mines using the CARDOX Mining Method.

CARDOX

HARDSOCG DRILLING EQUIPMENT

Complete line of drilling equipment designed to give you the maximum in drilling efficiency.

● Increased tonnage is only one of many advantages the CARDOX Non-Explosive Mining Method provides. For example, its use removes many of the causes of mine fires; and the availability of CARDOX tubes as emergency fire extinguishers makes it possible to check potentially serious coal and electrical fires at their inception.

The card reproduced here shows how to get quick and effective fire fighting action with CARDOX tubes. The carbon dioxide released spreads rapidly and uniformly... even against a strong draft. It penetrates where water or rock dust cannot reach, does not wet or otherwise damage any material or machinery, and is amazingly effective in smothering and cooling out stubborn fires.

A free test in your own mine will prove the effectiveness of CARDOX in stepping up production, while decreasing roof and rib hazards, dust and gas explosions, and fire damage.

CARDOX CORPORATION

BELL BUILDING CHICAGO 1, ILLINOIS

POWERED for Industry

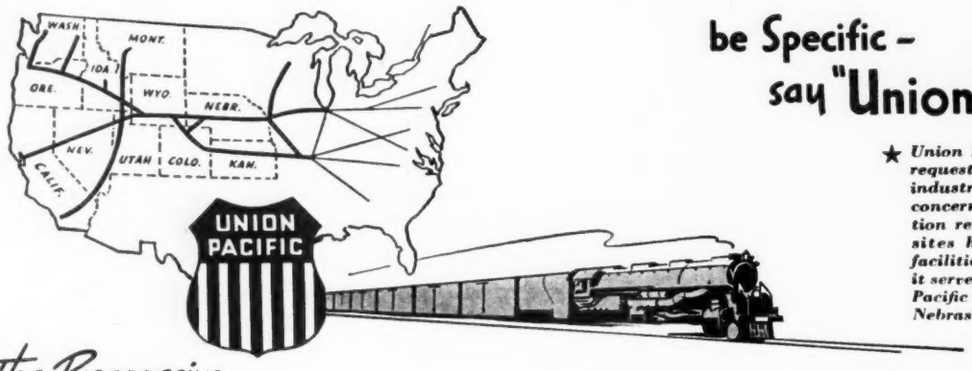


Pictured above is another reason why Union Pacific can maintain fast schedules. It's one of the "Big Boys," 600-ton super-powered freight locomotives designed to meet industry's heaviest demands.

But it takes more than horsepower to keep shipments rolling on schedule. The "know how" of many thousands of trained Union Pacific employees . . . the time-saving Strategic Middle Route uniting the East with the West Coast . . . are *plus* advantages only Union Pacific provides.

Union Pacific traffic experts are located in metropolitan cities from coast to coast. Call on them to assist in solving your transportation problems.

For efficient, dependable freight service—



be Specific – say "Union Pacific"

★ *Union Pacific will, upon request, gladly furnish industrial or mercantile concerns with information regarding available sites having trackage facilities in the territory it serves. Address Union Pacific Railroad, Omaha, Nebraska.*

The Progressive

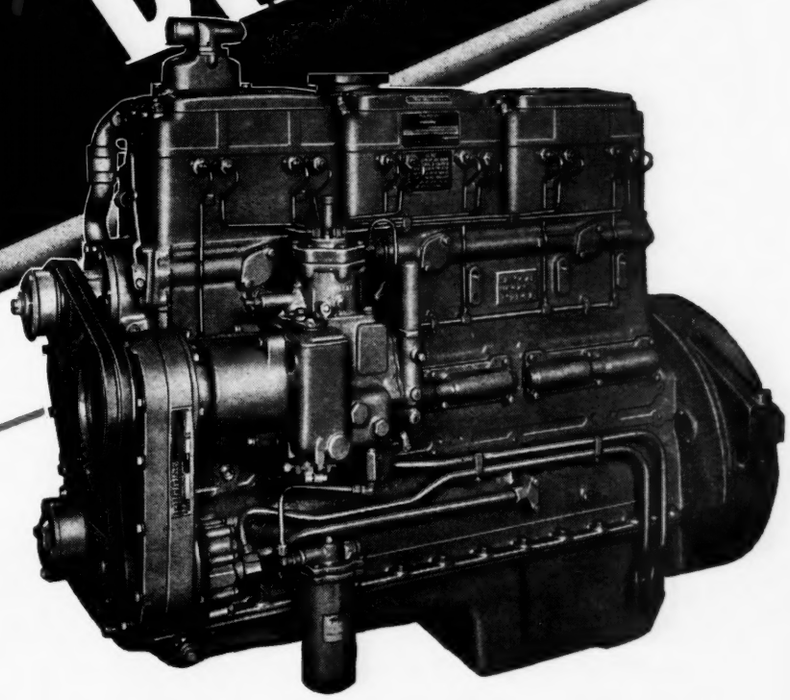
UNION PACIFIC RAILROAD

The Strategic Middle Route

Bigger Loads... More Trips

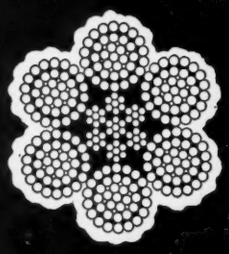
with

CUMMINS *Dependable* DIESELS



CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

For Strength plus Flexibility



UPSON-WALTON
6x37 LAYRITE WIRE ROPE



FOR overhead traveling cranes in steel mills, for winch lines and slings, for holding and closing lines on grab buckets, for towing hawsers and mining machine ropes—industry after industry has conditions where high strength must be combined with great flexibility.

Wherever drum or sheave diameters are small, or where reverse or acute bends are encountered, fatigue stresses are high. For this type of service Upson-Walton 6 x 37 Perfection Layrite Cable is best because the individual wires in the strand are finer; therefore they are more flexible and better able to resist fatigue stresses. In addition, the greater number of fine wires in the rope gives it a greater metallic area, so strength is still high.

Hemp center or, where crushing conditions are extremely severe, IWRC (independent wire rope center).

Specify Upson-Walton 6 x 37 when you need maximum flexibility plus a high degree of strength.

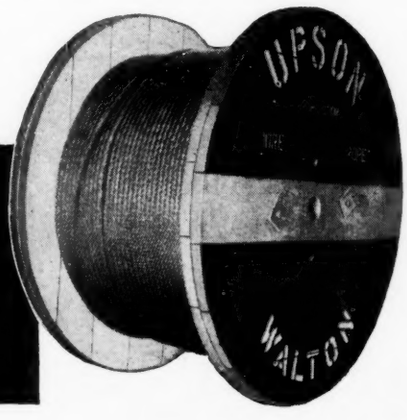
Specify Perfection grade because this improved plow steel is the strongest and toughest and most resistant to wear of all the grades of wire used to make rope.

Specify Layrite because this fine *pre*formed wire rope results in longer life, greater safety and greater economy.

Upson-Walton 6 x 37 Perfection Layrite is worth specifying, and always up to specifications!

Established 1871

Copyright 1946—The Upson-Walton Company



THE UPSON-WALTON COMPANY

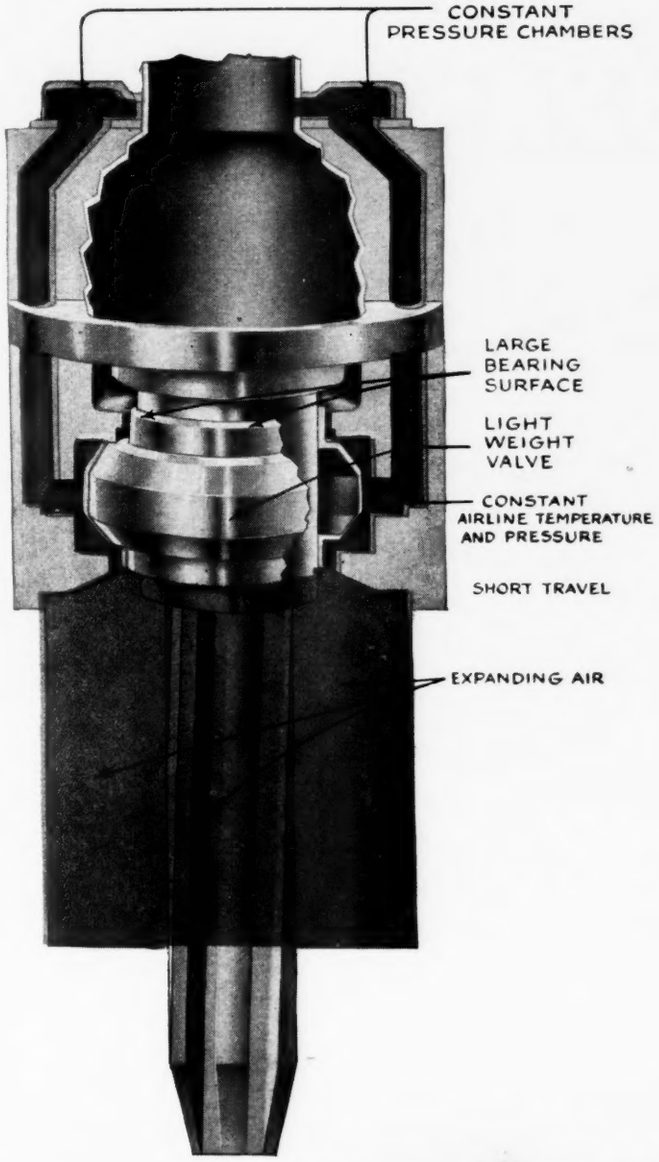
Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4 | 737 W. Van Buren Street, Chicago 7 | 241 Oliver Building, Pittsburgh 22

WHY LEADING MINING MEN SPECIFY Thor ROCK DRILLS





The ENGINEER knows that . . . Thor's Light Weight, Short-Travel Valve Produces More Work—Cuts Operating Costs!

The Valve is to an air tool what the carburetor is to an automobile engine . . . the vital *heart* controlling the inlet of power. So intricate is the valve, however, that only engineers who know its function recognize what benefits it can contribute to an air tool's performance and service life.

Leading engineers everywhere specify Thor Tools because Thor valves provide *faster, better work—at lower operating costs*—through these features:

SPEED . . . *Air Economy*. Extremely light in weight, the Thor Valve moves faster to provide more blows per minute. It maintains this relative high efficiency even at low air line pressures.

POSITIVE ACTION. Light weight, short-travel—and the important fact that the Thor Valve is actuated by the difference between air line pressure and exhaust pressure—assures positive action that *completes every blow.*

ENDLESS LIFE. Light weight and short-travel—plus the *large bearing surface* on which the Thor Valve operates—eliminates breakage . . . reduces wear to a minimum.

NON-FREEZING . . . *Never "Air-starved."* Constant pressure chamber maintains air at constant line temperature and pressure. Air cannot expand until it passes valve . . . thus valve cannot "freeze."

EXACT TIMING and BALANCE. All these valve functions are in perfect-timing and balance with the piston hammer. Every stroke is air-cushioned; every blow is complete and powerful.

Have your engineer check these Thor advantages. He'll agree—your nearby Thor Distributor stocks the tools that will give you *more work . . . at lowest cost!*

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
BIRMINGHAM BOSTON BUFFALO CLEVELAND DETROIT LOS ANGELES MILWAUKEE NEW YORK PHILADELPHIA PITTSBURGH ST. LOUIS SALT LAKE CITY SAN FRANCISCO TORONTO, CANADA LONDON, ENGLAND

. . . Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

NOW... every B.C.I. to the SELLS COAL HOME



TO MAKE DREAM HOMES COME TRUE

America, always a home-loving land, now readies herself to move into wondrous new homes whose comforts and conveniences will match those of any air castle of the mind . . . Homes where many of the household chores will be performed by the push of a button . . . Homes whose indoor climate will equal the best that nature has to offer . . . Homes whose rooms will be healthfully warmed by the steady, uniform flow of automatic coal heat.

Coal . . . the Modern Fuel

Bituminous Coal has long been valued as the most economical, most dependable of all home-heating fuels. That's one reason why more than 4 out of every 7 homes in the U. S. already heat with coal. And today, with the development of marvelously efficient new stokers to suit the needs of any size of home, Bituminous Coal also becomes the modern fuel—completely automatic, even to the point of ash removal—clean, quiet, odorless, smokeless!

Coal . . . the Plentiful Fuel

Thanks to the unlimited bounty of nature, America boasts a 3,000-year treasure trove of Bituminous Coal. What more satisfying assurance could any new-home builder have that his coal supply will always be available—will always be low in cost, no matter how high the prices of other fuels may climb?

BITUMINOUS COAL INSTITUTE
60 East 42nd Street, New York 17, N. Y.

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS

BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . .

advertisement General Public *FOR HEATING!*



Backing up the business of every retail coal dealer, a forceful message on home heating is now included in every Bituminous Coal Institute advertisement to the general public.

Running in full color in the *Saturday Evening Post* and *Liberty* . . . and in black and white in *Newsweek*, circulated to newspaper editors in *Editor & Publisher* and *National Publisher* . . . these full-page advertisements are illustrated by the world-renowned painter, Rockwell Kent. In the advertisement at the left, coal heat for homes is the main theme of the copy. All advertisements in this series feature the advantages of coal and modern coal-burning equipment for home heating.

With the rest of the Bituminous Coal Institute's broad program of advertising and publicity, this campaign is telling a story that needs telling—telling it to the people who determine the future of the entire coal industry.

BITUMINOUS COAL INSTITUTE
60 East 42nd Street, New York 17, N. Y.

POWERS THE PROGRESS OF AMERICA

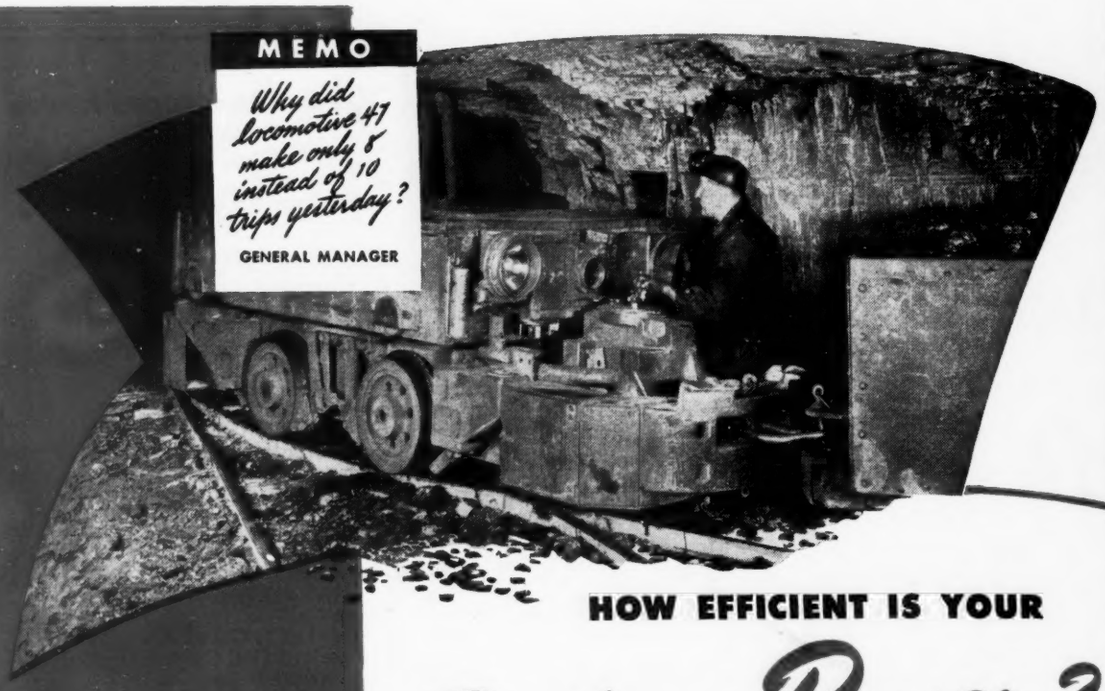
These Operators Make Possible the Progressive Program of the B.C.I.

Algoma Coal & Coke Co.
American Coal Co.
Anchor Coal Co.
Atlantic Smokeless Coal Co.
Ayrshire Collieries Corp.
Barnes & Tucker Co.
Bellingham Coal Mines
Berwind White Coal Mining Co.
Boone County Coal Corp.
Central Indiana Coal Co.
Chicago, Wilmington & Franklin Coal Co.
Clinchfield Coal Corp.
Clover Splint Coal Co., Inc.
Columbus Mining Co.
Consolidation Coal Co.
Crab Orchard Improvement Co.
Crowe Coal Co.
Crozer Coal & Coke Co.
Cumberland Coal Co.
Darr Smokeless Coal Co.
De Bardeleban Coal Corp.
Delta Coal Mining Co.
Donegan Coal & Coke Co.
Eagle Cherokee Coal Mining Co.
Enos Coal Mining Co.
Gay Coal & Coke Co.
Gay Mining Co.
Hanna Coal Co.
Hart Coal Co.
Harvey Coal Corp.
Hume-Sinclair Coal Mining Co.
Huntsville-Sinclair Mining Co.
Imperial Smokeless Coal Co.
Island Creek Coal Co.
Jamison Coal & Coke Co.
Jefferson Coal Co.
Jewel Ridge Coal Co.
Knott Coal Corp.
Koppers Coal Division
Little John Coal Co.
Lorado Coal Mining Co.
Loraine Coal & Dock Co.
Loyal Hanna Coal & Coke Co.
Marianna Smokeless Coal Co.
Marigold Coal Mining Co.
Mill Creek Coal & Coke Co.
Monitor Coal & Coke Co.
Morrisdale Coal Mining Co.
New River Co.
New York Coal Co.
Page Coal & Coke Co.
Peerless Coal & Coke Co.
Pittsburgh Coal Co.
Pittsburgh & Midway Coal Mining Co.
Pocahontas Corporation
Pocahontas Fuel Co., Inc.
Pond Creek Pocahontas Co.
Powhatan Mining Co.
Red Jacket Coal Corp.
Sahara Coal Co.
Seneca Coal & Coke Co.
Sentry Coal Mining Co.
Sooner Coal Mining Co.
South-East Coal Co.
Sovereign Pocahontas Co.
Standard Coal Co.
Stonega Coke & Coal Co.
Tierney Mining Co.
Truax-Traer Coal Co.
Turkey Gap Coal & Coke Co.
Valley Camp Coal Co.
West Kentucky Coal Co.
Westmoreland Coal Co.
West Virginia Coal & Coke Co.
Youghiogheny & Ohio Coal Co.

MEMO

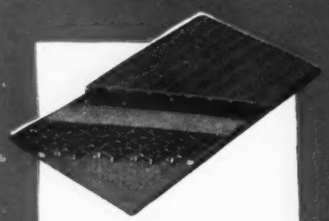
Why did locomotive 47 make only 8 instead of 10 trips yesterday?

GENERAL MANAGER



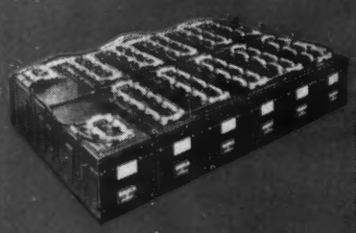
HOW EFFICIENT IS YOUR

Battery Power?



KATHANODE UNIT

The positive plate assembly of Gould Kathanode includes grid, Black Oxide active material, spun-glass mats and Unit-Seal envelop. Separators are of Durapor porous rubber.



Gould Kathanode power is sustained power. It assures speedy and economical mine locomotive operation even during the latter stages of Kathanode's long service life.

The main reason for the sustained power of Gould Kathanode is the unusual protection of the power-producing positive plates. These have spun-glass mats in contact with each face that are held in place by specially designed porous rubber envelops. Solid at the edges and with open ends, these envelops allow spent active material to filter out. It cannot lodge or tree. Internal short circuits, a common cause of power losses, are minimized in Kathanode.

Keep your mine locomotive running with Kathanode. Write Dept. 114 for Catalog 200 on Gould Kathanode Glassklad Batteries for Mine Locomotive Service.

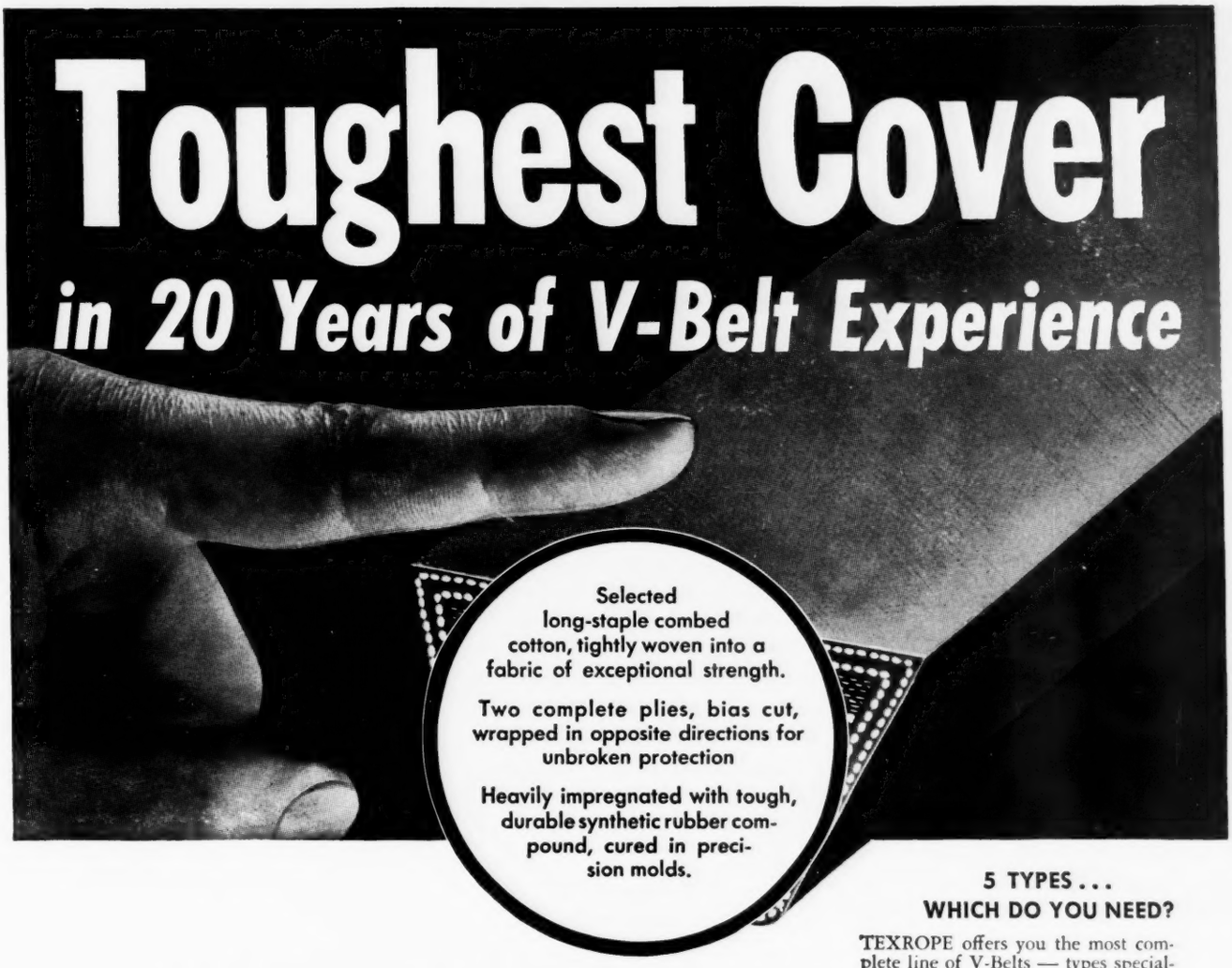
GOULD

KATHANODE

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.

Factories: Atlanta • Boston • Chicago Dallas • Depew • Leavenworth • Los Angeles • North Bergen • Rock Island Saint Paul • Salem • Sioux City Zanesville

Toughest Cover
in 20 Years of V-Belt Experience



Allis-Chalmers Builds Longer Life Into Famous TEXROPE V-Belts

A V-Belt is no better than its COVER. And . . . TEXROPE Super-7 belts today carry the toughest, most wear-resistant cover that Allis-Chalmers has developed since they invented the Multiple V-Belt Drive! It's the result of 20 years of continuous research and improvement.

This tough, resilient sheath is unbroken and unweakened by grooves or serrations. It takes the wear, holds the belt in shape, protects the load-carrying core structure.

Added Strength — Smoother, Cooler Running

50% Stronger Cords, impregnated with friction-fighting gum rubber. *War-proved Buna-S,* better, cooler-running than natural rubber. *Perfect Balance,* every belt accurately proportioned, precision molded to run true and cool. Make Allis-Chalmers your V-Belt headquarters! ALLIS-CHALMERS, Milwaukee 1, Wisconsin.

A 2003

5 TYPES . . . WHICH DO YOU NEED?

TEXROPE offers you the most complete line of V-Belts — types specially developed to meet ALL operating conditions. Pick the right TEXROPE Super-7 V-Belt — it'll give you the most in efficient power transmission.



Heat-Resisting Super-7
Stands temperatures up to 180°. The TEXROPE V-Belt for most drives.

Oil-Resisting Super-7
Neoprene cover protects core against moderately oily or greasy conditions.

Oil-Proof Super-7
Made of Neoprene throughout. Use it when the belt must swim in oil.

Static-Resisting Super-7
Recommended where explosion hazard exists. Static-conducting element throughout cover won't wear off.

Super-7 Steel
Twin steel cables, to pull extremely heavy loads with minimum stretch.

GET THEM — through your Allis-Chalmers district office or dealer.

TEXROPE Super-7 V-Belts result from the cooperative research of two great companies—Allis-Chalmers and B. F. Goodrich — and are sold exclusively by A-C.



V-BELTS
TEXROPE complete line — Sizes, types for every power transmission problem and condition.

ALLIS CHALMERS
TEXROPE V-BELT DRIVES
ORIGINATORS OF THE MULTIPLE V-BELT DRIVE



SHEAVES
"MAGIC-GRIP" . . . TEX-STEEL . . . TEXDRIVE . . . Speed changers and VARI-PITCH sheaves.

HEAR THE BOSTON SYMPHONY: *Every Saturday Evening, American Broadcasting Co.*



30% OF ALL BITUMINOUS COAL MECHANICALLY CLEANED IN U. S. IS PRODUCED BY McNALLY PITTSBURG PROCESSES

The heart of the preparation plant is the washer . . . the McNally-Norton, Rheolaveur, Heavy Density, or any one of the six cleaning processes owned and manufactured by McNally Pittsburg and available for specification. Regardless of the impurities in your run of mine coal feed, the beneficiation to be accomplished is studied, and the cleaning process best suited to your needs is installed.

At the touch of a finger on the control switch, the cleaning process in your plant automatically controls the definite ash content, hour after hour, week after week. It assures uniformity; guarantees any possible ash content, removing all impurities from all mechanically cleaned sizes from zero up.

The functional design of a McNally Pittsburg structure provides for the labor-saving, compact arrangement of equipment to turn run of mine coal into premium priced fuel.

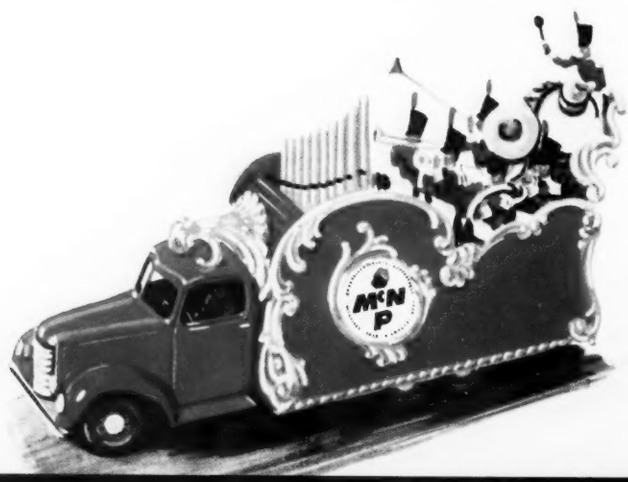
Under the flat top, set-back roof you will find crushers, screens, conveyors, dryers, and loading equipment designed by McNally Pittsburg with the single objective . . . to recover for you the greatest tonnage possible in premium fuel.

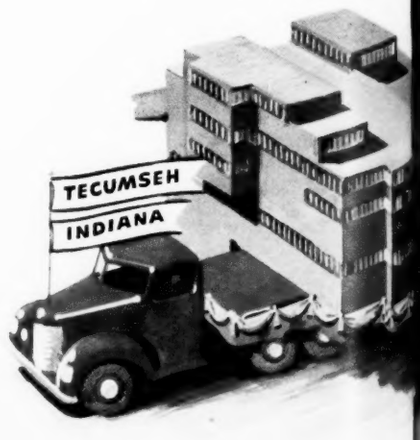
NEW PLANTS NOW UNDER CONSTRUCTION WILL ADD OVER 8,700,000 TONS ANNUALLY

The increasing demand for coal to specifications is evidenced by the construction of five new McNally Pittsburg plants. These plants, located in West Virginia, Kentucky, Illinois, Montana, and Indiana will have an annual tonnage of 8,700,000 tons or a total for McNally Pittsburg of over 50,000,000 tons of cleaned coal per year.

The demand for specification fuel is encouraging many operators to take initial steps to produce premium priced fuel. Our technical staff is at the service of any operator who wants to establish such a market and continue to retain it.

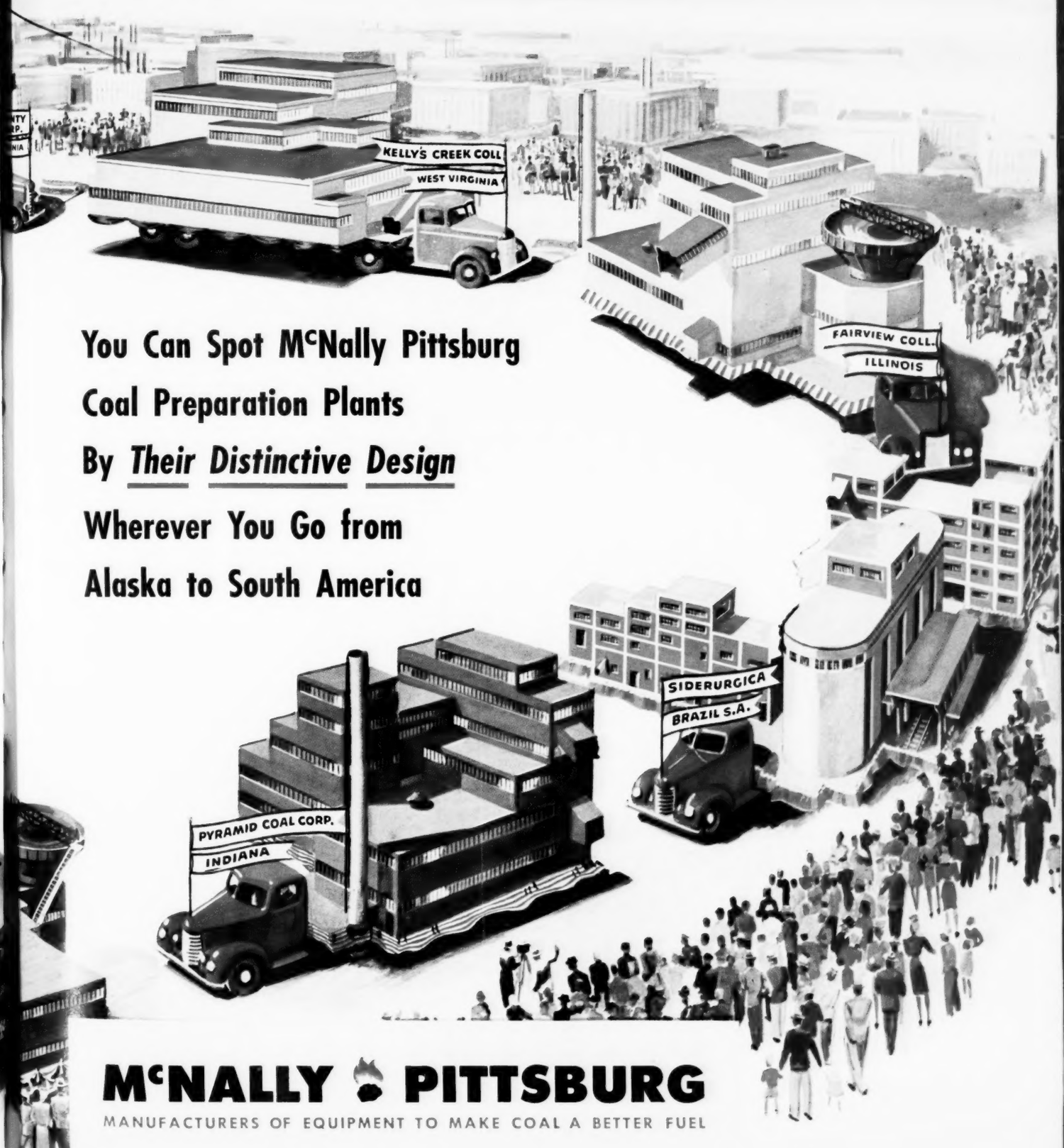
McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans.
Chicago 1, Ill. • Pittsburgh 22, Pa. • Caixa Postal 1310, Rio de Janeiro, Brazil





FLAT TOP, SET-BACK ROOFS . . .

THE IDENTIFYING DESIGN OF McNALLY PITTSBURG PREPARATION



You Can Spot McNally Pittsburg Coal Preparation Plants By *Their Distinctive Design* Wherever You Go from Alaska to South America

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL



KOEHRING

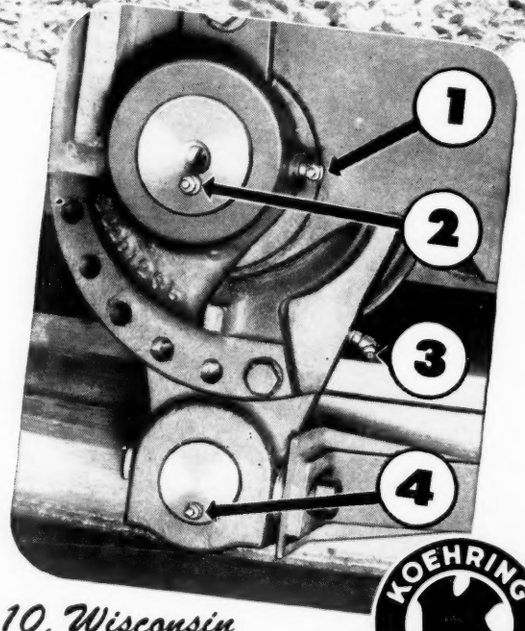
605

1½ YARD SHOVEL

TO KEEP THIS ROCK SHOVEL FROM ROCKING

4 Grease Fittings Keep Each Hook Roller Easily Adjustable

On the New Koehring 605, the turntable need never "rock" on the lower as you dig, swing or dump. It's so easy to keep the 6 hook rollers, which tie the turntable to the lower, snug against the roller path. Moving the eccentric brackets quickly eliminates "rocking". Brackets always move easily, won't "freeze" or rust tight, because 4 grease fittings assure complete lubrication of the entire assembly. Adjustment is so quick and easy, the operator won't hesitate to make it.



KOEHRING COMPANY • *Milwaukee 10, Wisconsin*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT



NO JOB TOO TOUGH FOR A

RUGGED BWH CONVEYOR BELT!

Over 15,594 tons of copper ore daily . . . for 2,256 days . . . that's the record of a Bull Dog Conveyor Belt in one of America's great copper mines.

That, the operators told us, is a record to be proud of! But, our records show that similar dependable service is being rendered by other BWH belts in all types of industry from coast to coast . . . and at lower maintenance cost. Such ruggedness is due to the exclusive BWH ROTOCURE process of continuous vulcanization.

The dependability of BWH for producing conveyor belts and other products of remarkable toughness has established it as a leader in the industrial rubber goods field. So depend on BWH for dependable ruggedness . . . on BWH distributors for dependable service.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearest BWH distributor, or write to BWH direct.

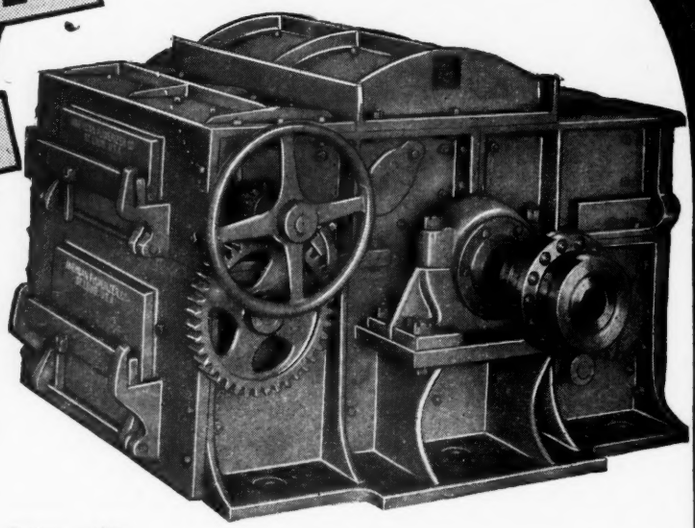
BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in All Principal Cities

WORKS: CAMBRIDGE, MASS., U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

UNIFORM SIZING
MINIMUM FINES
with NO OVERSIZE

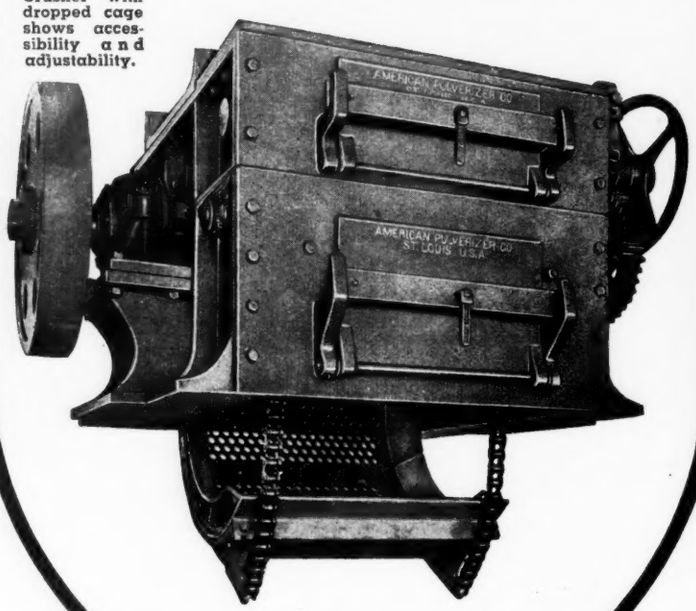
American high capacity AC models are rugged—yet compact for minimum headroom.



Get better—lower cost coal preparation with AMERICAN Rolling Ring Crushers

Americans are outstanding in the coal preparation plant's two requirements: *quality of product* and *quantity of production*. To assure the quality of product which requires *uniformity* of sizing—Americans patented Shredder Rings split coal instead of crushing it. This exclusive action controls the reduction to marketable sizes without excessive fines. ROM coal is uniformly reduced to lump, egg or nut sizes in circuit for further reduction to stoker or pulverizer sizes—or ROM is uniformly reduced in one-step operation . . . 28" to ½" with a minimum of fines and no oversize—and *double adjustment* makes size control easily accessible.

Bottom view of American Rolling Ring Crusher with dropped cage shows accessibility and adjustability.



The many cutting edges of American Shredder Rings mounted in multiples on their rotor shafts and revolving at the proper centrifugal force results in great production efficiency and low cost operation. American Crushers are available in capacities from 50 to 500 TPH.

Send for bulletin and specifications of the American A. C. Ring Crusher to see how well it fits your coal preparation

COAL IS SPLIT - NOT CRUSHED

American PULVERIZER COMPANY

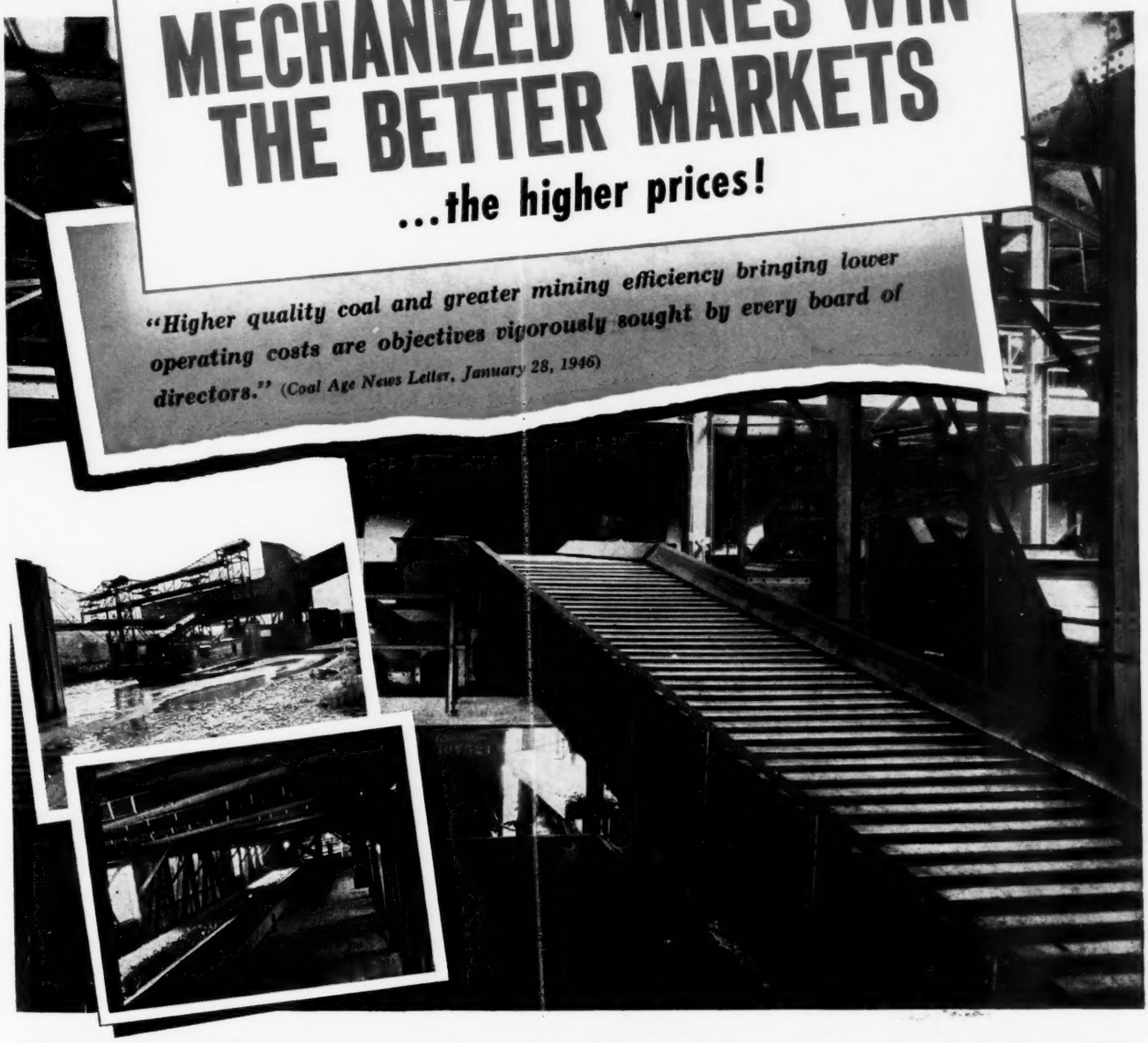
Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave.
St. Louis 10, Mo.

MECHANIZED MINES WIN THE BETTER MARKETS

...the higher prices!

"Higher quality coal and greater mining efficiency bringing lower operating costs are objectives vigorously sought by every board of directors." (Coal Age News Letter, January 28, 1946)



PROGRESSIVE mine managements are pushing mechanization below and *above* ground because tonnage records of mechanized mines show increases of 400% (for strip mines) to 1200% (for deep mines) since 1934—while mines using hand loading methods have shown only slight increases.

Also—the modern preparation equipment that raises product value by producing *clean* coals—cuts labor and waste and thus lowers costs.

Morrow Tipples have been specified in a high percentage of modern mechanized mines, because Morrow *streamlines* production from mines to cars or barges, in shorter time, at lower cost—in the best condition to sell!

Ask Morrow to assign an engineer to study your situation. Write The Morrow Manufacturing Company, 1940 Ford Boulevard, Wellston, Ohio. *Division The Wacker Corporation.*

Better Preparation
=INCREASED SALES!

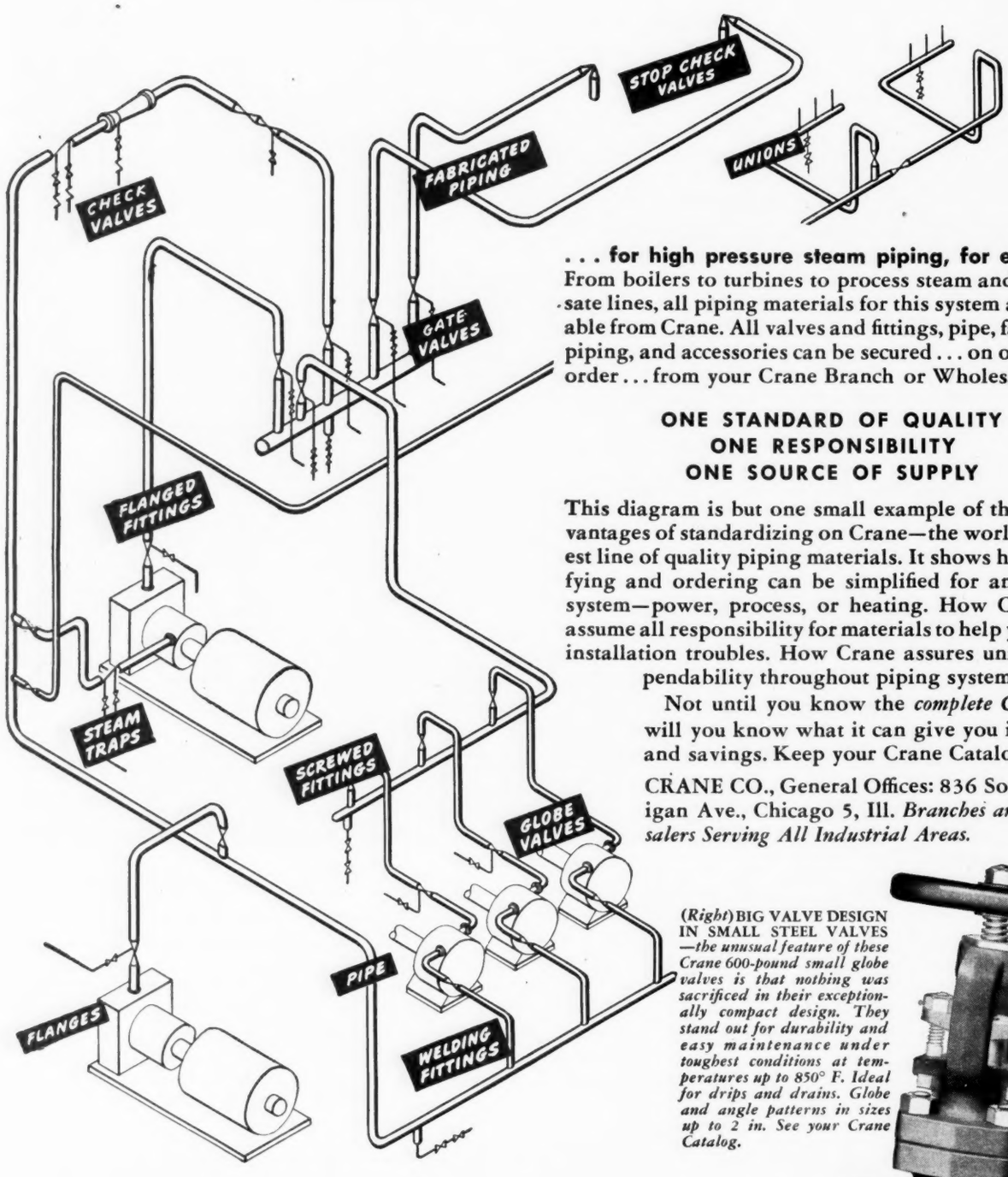
1. low impurity content
2. correct sizing
3. high uniformity

MECHANIZE WITH MORROW

COAL WASHERS • WEIGH PANS • FEEDERS • DUMPS
BINS AND BIN GATES • FLANGED LIP SCREENS
CONVEYORS • LOADING BOOMS • SHAKING SCREENS
VIBRATING SCREENS • CAR HAULS • PICKING TABLES
SETTLING TANKS • ELEVATORS • CAR RETARDERS
PERFORATED METAL SCREENS • STEEL STRUCTURES

ONE ORDER TO CRANE...

Covers All Piping Materials



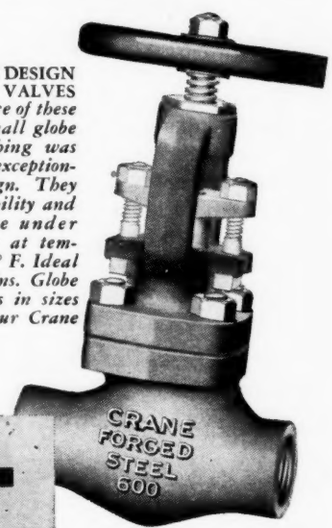
. . . for high pressure steam piping, for example. From boilers to turbines to process steam and condensate lines, all piping materials for this system are available from Crane. All valves and fittings, pipe, fabricated piping, and accessories can be secured . . . on one single order . . . from your Crane Branch or Wholesaler.

ONE STANDARD OF QUALITY
ONE RESPONSIBILITY
ONE SOURCE OF SUPPLY

This diagram is but one small example of the big advantages of standardizing on Crane—the world's greatest line of quality piping materials. It shows how specifying and ordering can be simplified for any piping system—power, process, or heating. How Crane can assume all responsibility for materials to help you avoid installation troubles. How Crane assures uniform dependability throughout piping systems.

Not until you know the *complete Crane line* will you know what it can give you in service and savings. Keep your Crane Catalog handy.

CRANE CO., General Offices: 836 South Michigan Ave., Chicago 5, Ill. *Branches and Wholesalers Serving All Industrial Areas.*



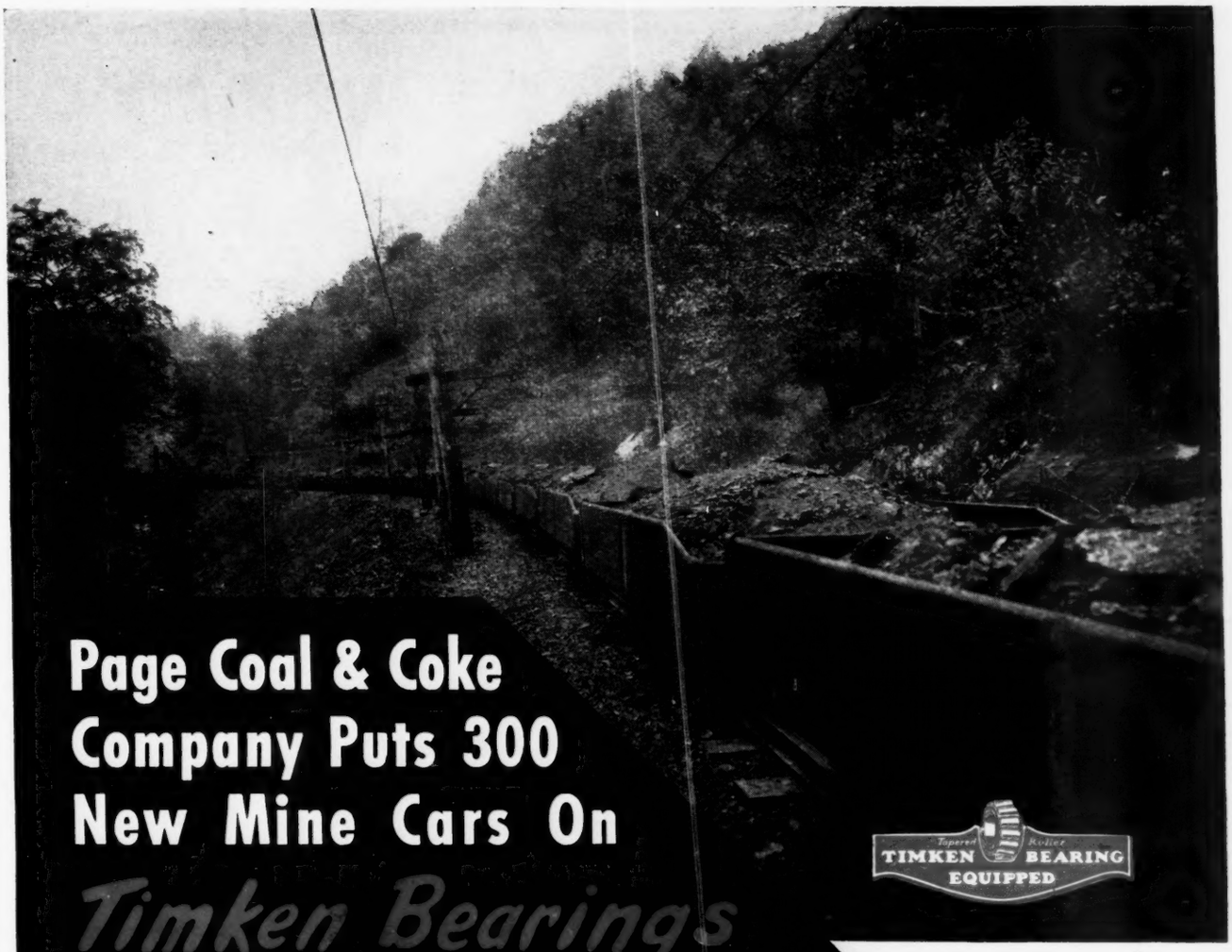
(*Right*) BIG VALVE DESIGN IN SMALL STEEL VALVES —*the unusual feature of these Crane 600-pound small globe valves is that nothing was sacrificed in their exceptionally compact design. They stand out for durability and easy maintenance under toughest conditions at temperatures up to 850° F. Ideal for drips and drains. Globe and angle patterns in sizes up to 2 in. See your Crane Catalog.*

EVERYTHING FROM . . .

CRANE

FOR EVERY PIPING SYSTEM

VALVES • FITTINGS
PIPE • PLUMBING
HEATING • PUMPS



Page Coal & Coke Company Puts 300 New Mine Cars On *Timken Bearings*

Tapered Roller TIMKEN BEARING EQUIPPED

The Page Coal & Coke Co., Pageton, West Virginia bought their first Timken Bearing Equipped mine cars in October, 1925—over 20 years ago.

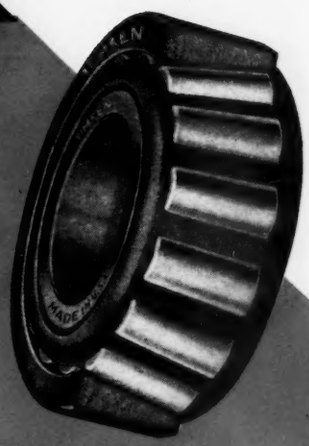
Additional car orders beginning 6 months later resulted in the complete replacement of their plain bearing cars with Timken Bearing cars by 1931.

At that time they had 860 Timken Bearing Equipped cars in service. The operation of these cars: (1) increased coal tonnage hauled per train 20%; (2) reduced car lubrication costs 86.9%; (3) reduced car maintenance costs 84.5%; (4) reduced track maintenance (due to wrecks) almost 100%; (5) reduced power consumption per ton hauled.

The above facts, and many others equally gratifying, were revealed in an impartial survey made by the A. C. Nielsen Company of Chicago and New York, a widely known and respected independent industrial research organization.

Last year the Page Coal & Coke Co. took another big step forward in mine haulage economy by purchasing 300 new Timken Bearing Equipped, all-steel stub axle mine cars of greater capacity than any cars they have previously used. These cars, some of which are shown in the photograph, were built by American Car & Foundry Company, Huntington, W. Va.

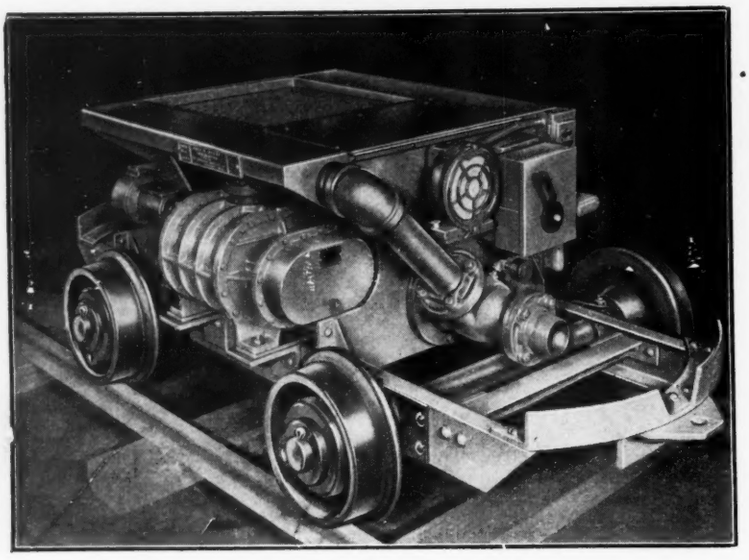
Only genuine Timken Bearings can give you these Timken Bearing advantages. Look for the trade-mark "TIMKEN" on every bearing that goes in your equipment. The Timken Roller Bearing Company, Canton 6, Ohio.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

ROCK DUSTING IS BETTER THAN INSURANCE

Rock Dusting with DISTRIBUTORS Safeguards Lives and Property



The LITTLE GIANT

A high pressure machine that can be used on entries and in remote areas to a distance of 100 feet. Compactly and rigidly built for hard service. Can be easily transported. Weight 1800 lbs. Overall height above rail 27 inches. Hopper capacity 400 lbs. Distributes 75 pounds of dust per minute.

A REAL BUY FOR AVERAGE SIZE MINE

THE DUSTMASTER — TROUBLE FREE PERFORMANCE

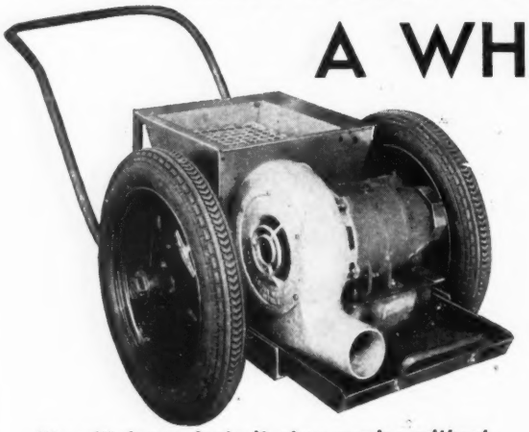
Safety devices on all essential units to protect the equipment and operators.

Greatest distributing capacity. Built as low as 25 inches above rail. Write for particulars.

250 lbs of dust per minute thru short hose
125 lbs of dust per minute thru 500 feet of hose.

THE MIGHTY MIDGET — A PORTABLE MACHINE THAT DOES

A WHALE OF A JOB



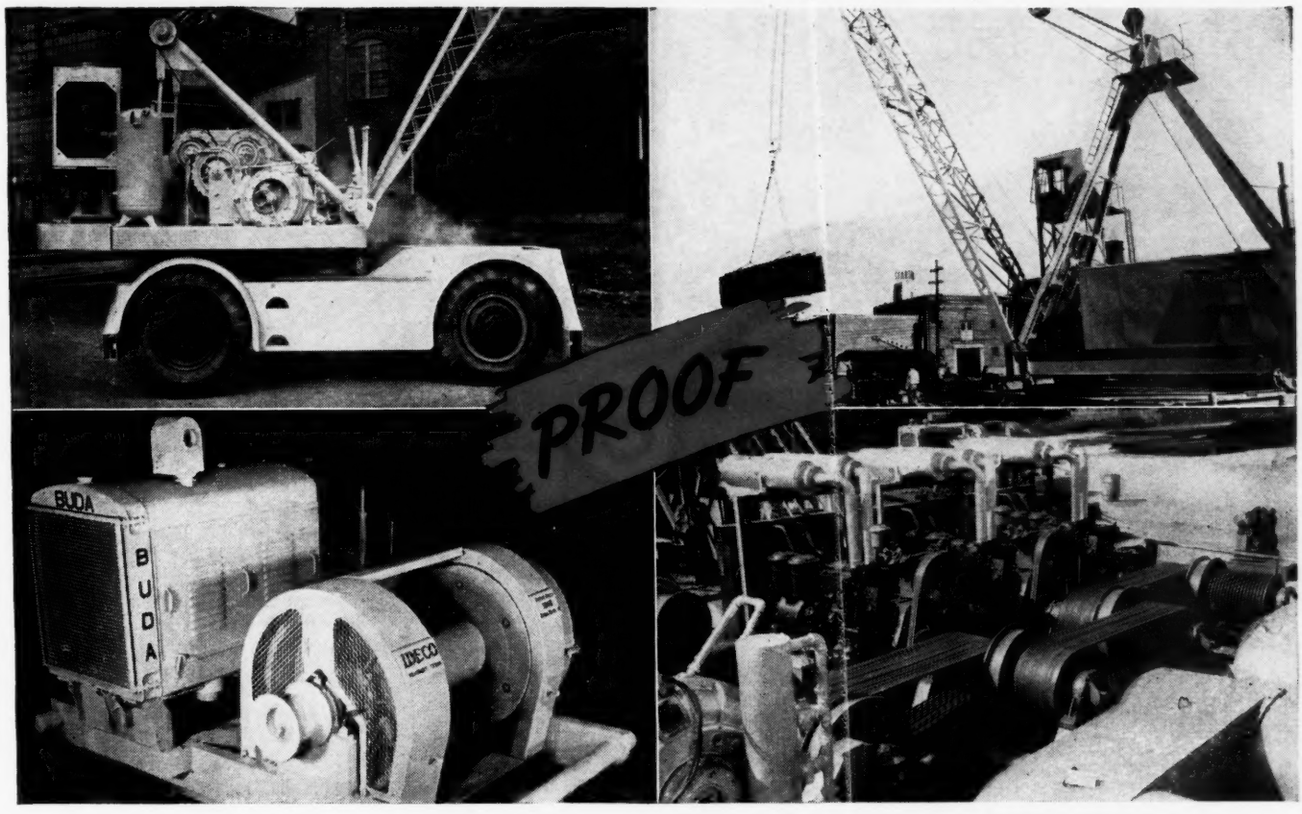
We will demonstrate it at your mine without obligation. SAY WHEN.

Equipped with a short hose nozzle and sufficient trailing cable it can be transported to rooms to dust faces or into remote sections, back areas and air courses. In actual performance it has distributed MORE THAN A TON OF DUST PER HOUR during an entire shift including lost time. It can be dragged on its bottom, transported on belt, in coal car, shuttle car, on low truck (we build), cart (like illustrated) or on the cutter bar of a mining machine.

ONE SHOULD BE IN EVERY MINE WITH OTHER EMERGENCY EQUIPMENT

Send for descriptive catalog of Safety Devices.

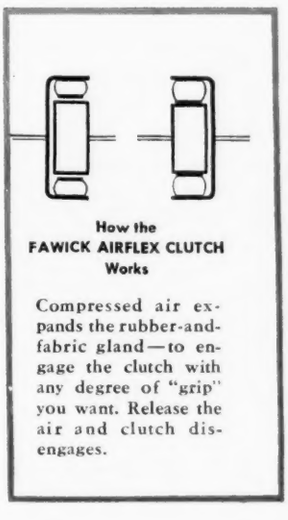
THE AMERICAN MINE DOOR COMPANY, 2057 DUEBER AVE., CANTON, OHIO



How to write CLUTCH SPECIFICATIONS

for Heavy-Duty Drives . . .

★



How the FAWICK AIRFLEX CLUTCH Works

Compressed air expands the rubber-and-fabric gland—to engage the clutch with any degree of "grip" you want. Release the air and clutch disengages.

- ☑ Do you want air-cushioned torque control—direct or remote?
- ☑ Do you want shock and vibration absorbed by a cushion of air?
- ☑ Do you want *uniform* clutch engagement, at all speeds, under all loads?
- ☑ Do you want complete freedom from troublesome moving parts—such as springs, arms, levers and toggles?
- ☑ Do you want complete freedom from lubrication and adjustment?
- ☑ Do you want lower operation and maintenance costs?

If you check these points YES, let our Engineering Department give you recommendations. Book on request.



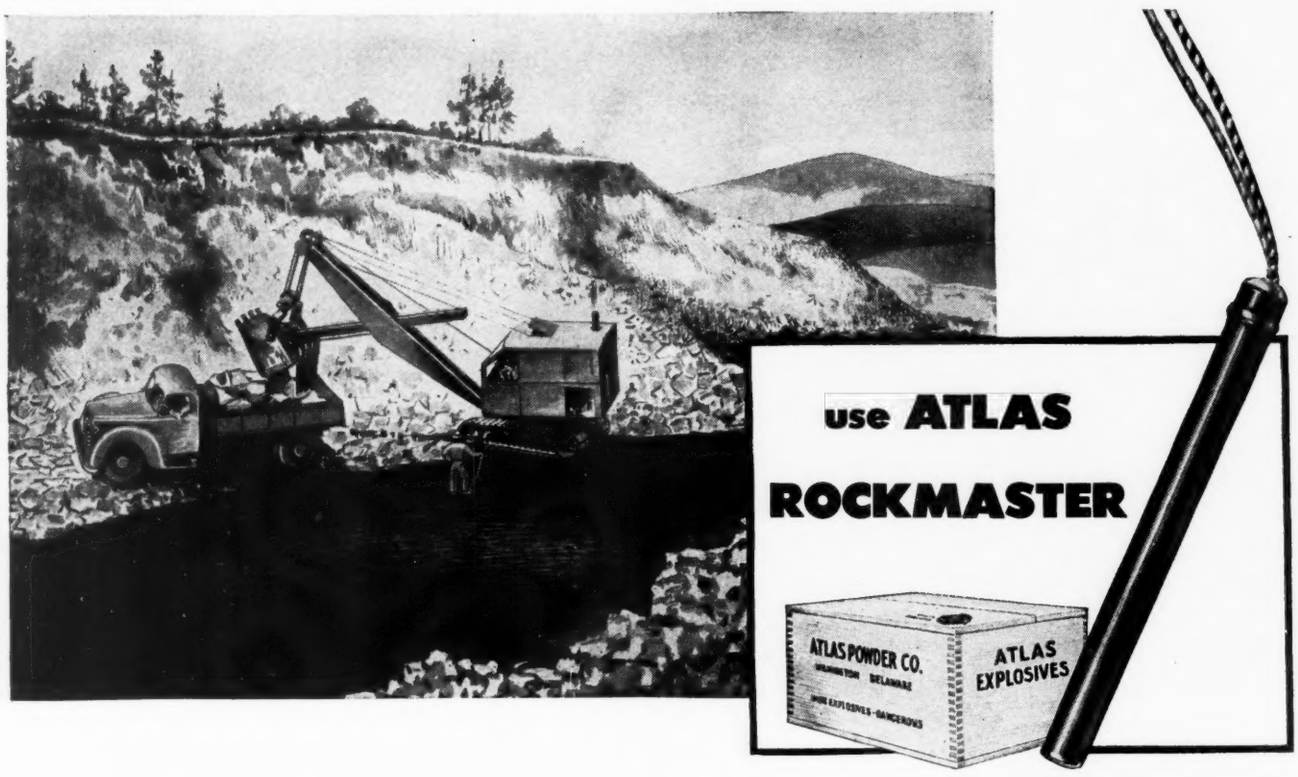
ARMY E NAVY

FAWICK *Airflex* CLUTCH

FAWICK AIRFLEX CO., INC. • 9919 Clinton Road, Cleveland 11, Ohio

In Canada, Reynold-Carmichael Ltd., Montreal, Toronto, Vancouver • In England, Crofts Engineers, Ltd., Bradford, England

Pulverize the Rock – Not the Coal

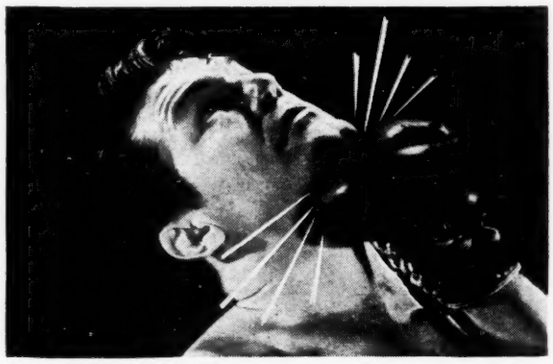


A New Development for Coal Stripping

Did you ever consider delayed-action blasting in stripping? It has been used to improve breakage of the overburden, and to save the coal.

The Atlas Rockmaster system of blasting has given more thorough fragmentation in certain strip pits than any previous method. That's due to the fact that Rockmaster, the first new blasting development since the war, uses the principle of delayed action, and an entirely new and revolutionary control over the time of firing.

Rockmaster has not proved to be the answer to *every* problem of coal stripping. But with your knowledge of your operation, and our knowledge of this new blasting system, it is likely that real improvement will result. Call in the Atlas Representative.



Why ROCKMASTER Improves Breakage

A left to the jaw—then a blow from the right. These two jabs in quick succession accomplish what no single blow could do. Atlas applies this principle of the one-two punch in the Rockmaster system of blasting.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

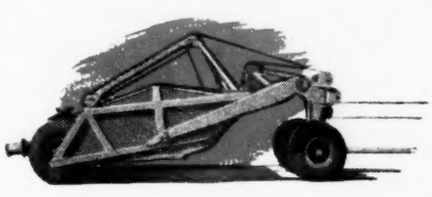
ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

GAR WOOD ROAD MACHINERY

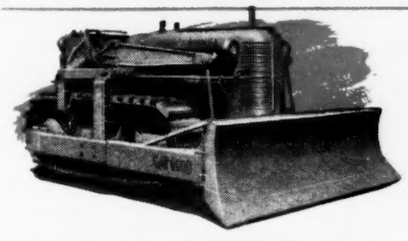
WITH ALLIS-CHALMERS DIESEL POWER

The trend is to—

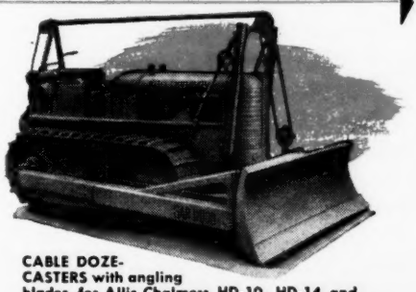




4-WHEEL CABLE SCRAPERS
Capacities: 11-15-20-25 cu. yds.



HYDRAULIC DOZECASTERS with angling blades, for all Allis-Chalmers Tractors



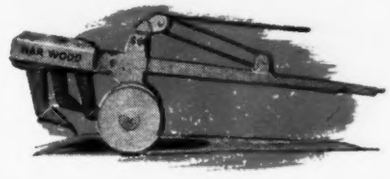
CABLE DOZE-CASTERS with angling blades, for Allis-Chalmers HD-10, HD-14 and HD-14C Tractors

On every kind of earth moving job, throughout the world, Gar Wood Road Machinery has made good, setting new high standards of performance and workmanship.

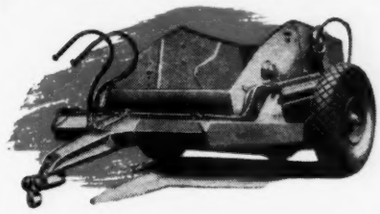
As a result, the demand for this equipment has steadily grown over a period of many years (see chart above) until now it has reached the proportions of a world-wide trend.

Here is a sound reason for specifying Gar Wood earth moving units. "Nothing succeeds like success."

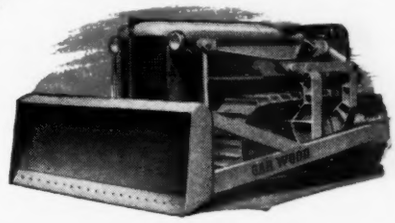
Contact your Allis-Chalmers dealer. Let him point out the superior features of Gar Wood Road Machinery and show you actual job performance in your territory with many satisfied users.



HEAVY DUTY RIPPERS
Cable and hydraulically operated



2-WHEEL HYDRAULIC SCRAPERS
Capacities: 3-5-6-8 cu. yds.



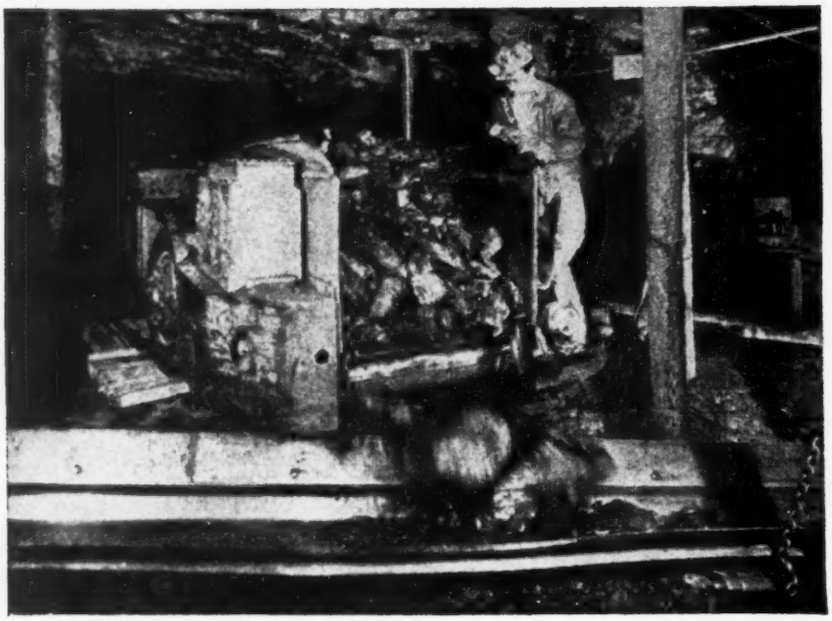
HYDRAULIC BULLDOZERS with fixed blades, for all Allis-Chalmers Tractors.

GW ROAD MACHINERY is Sold Through ALLIS-CHALMERS Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN

OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE: HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

Use BATTERY-POWERED shuttle cars for greatest safety



Courtesy of Engineering and Mining Journal



...ALKALINE BATTERIES

for most dependable power

BECAUSE they carry their own power supply, battery-operated shuttle cars are a distinct asset to the maintenance of utmost safety underground. They eliminate the possibility of danger from making and breaking connections to an external power supply. They are also available as permissible equipment approved by the Bureau of Mines.

Besides their safety advantages, battery-powered shuttle cars are the most flexible gathering units, have fewer moving parts requiring attention and replacements, reduce power peaks on the mine d-c supply, and have highest availability for service.

With batteries exchanged at the end of each shift, a shuttle car is kept continuously supplied with power. While one battery operates the car, the other is being charged.

Altogether the battery-powered shuttle car is an extremely dependable and efficient gathering unit—especially when powered with Edison Alkaline Batteries. Steel-cell construction, an electrolyte that is a preservative of steel, and a fool-proof principle of operation make alkaline batteries the most durable, longest-lived and most trouble free of all batteries offered for mine haulage services. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J. In Canada: International Equipment Co., Ltd., Montreal and Toronto.

Edison

ALKALINE BATTERIES

PMCo

America's Most Complete Line of Material Handling Buckets

ALL PURPOSE

CLAMSHELL

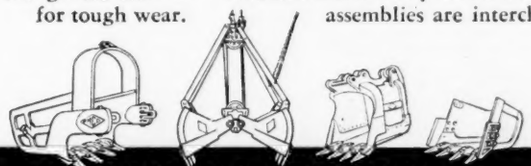
Sizes 3/8 to 2 Yards

A TOP QUALITY BUCKET

Scoops throughout of cast 14% manganese steel developing up to 120,000 tensile p.s.i. for hard abuse. Scoops interchangeable—no rights and lefts.

TEETH—14% manganese steel—for tough wear.

BRACES—Stationary and movable brace assemblies are interchangeable.



See your equipment dealer about PMCo Buckets.

WE MAKE ALL FOUR BUCKETS

"Quality Since 1880"

PETTIBONE MULLIKEN CORP. CHICAGO 51, U. S. A.

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

Figured Your Brattice Costs Lately?



When you do, the inevitable conclusion is that it pays to standardize on Moropa Brattice Cloth. Priced no higher than ordinary brattice, Moropa outwears them all . . . its exclusive chemical impregnation keeps it resistant to slime and fungus far longer. Your records will tell the story. Keep operating costs down with the famous MOROPA treatment—available on jute or cotton, in all standard widths and weights.

Manufactured and Distributed Only by

John Flocker and Company

644 GRANT STREET • PITTSBURGH 30, PA.

Since 1822, Ropes, Slings, Nets and Cordage Fittings, Tackles, Waxed and Unwaxed Linen . . . Specialists in Cordage Problems . . . Wire Rope



"Mine car operation Stepped up"

with Tycol mine car greases

Life of bearings prolonged . . .
Power requirements slashed . . .
Less lubricants needed . . .
Production accelerated . . .
Operating costs lowered . . .

Like mining engineers everywhere, you, too, will find that the *new* Tycol Mine Car Greases are expressly engineered for more efficient mine car operation . . . in or out of the mine . . . under all weather conditions.

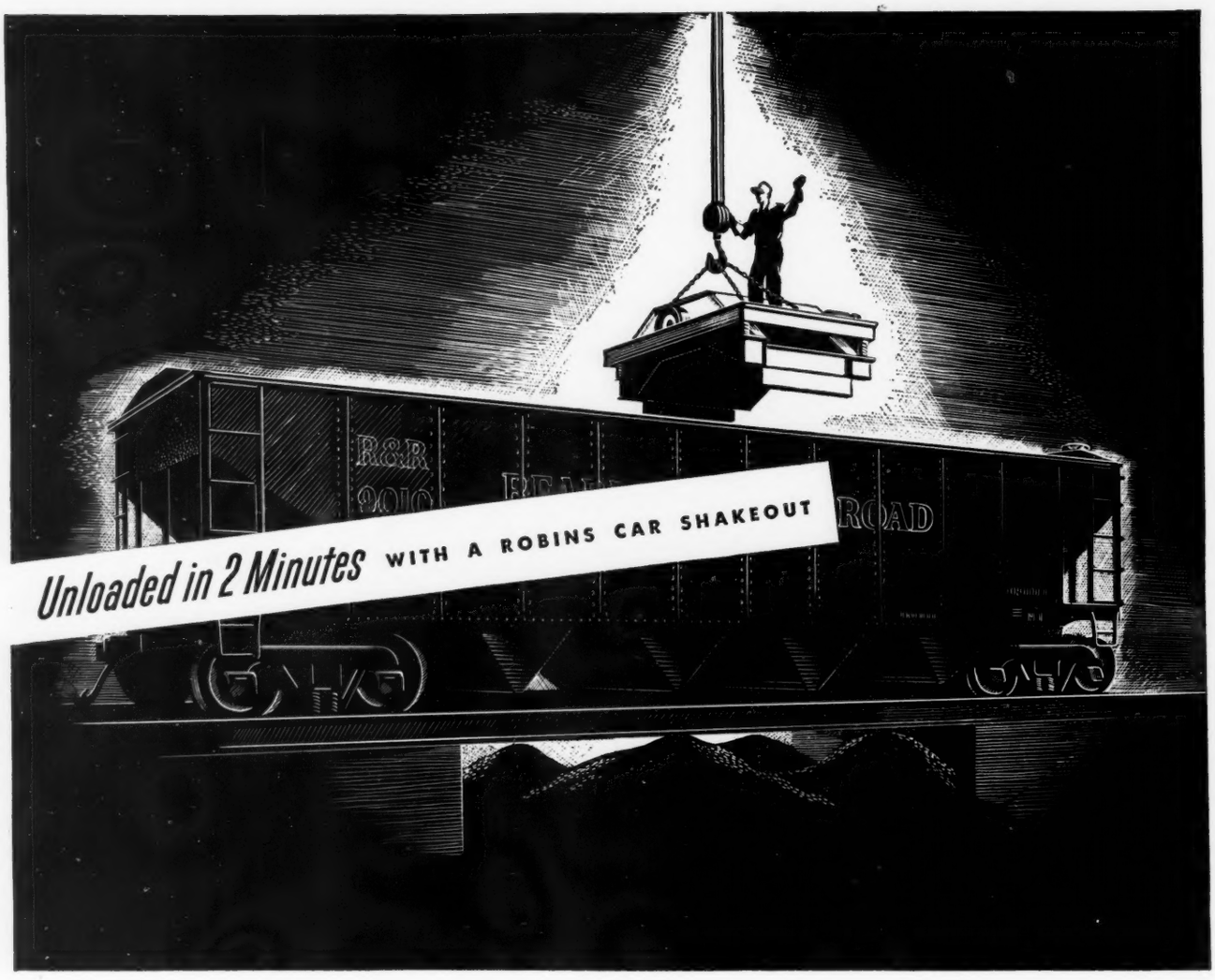
For details concerning the full benefits of Tycol Mine Car Greases, call your nearest Tide Water Associated Office today.

TYCOL
INDUSTRIAL LUBRICANTS

Boston • Charlotte, N. C.
Pittsburgh • Philadelphia

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE • NEW YORK 4, N. Y.

LUBRICATION—"ENGINEERED TO FIT THE JOB"



Only 2 *minutes* were required to empty a packed coal car using the exclusive *New* Robins Car Shakeout.

This is just one example of how this amazing "Job-Engineered" 1st, pioneered and developed by Robins, can help you save time, money, and equipment.

Operating at high speed, this machine literally shakes a load of tightly packed coal, coke, or ore through the hopper doors at the bottom of a railroad car—just as though a pair of giant hands picked up the car and shook it. Records of less than two minutes per car are by no means uncommon, and two men can do the work that previously required six or more.

No elaborate installation equipment or housing is required. Actually, you can use a Robins Car Shakeout anywhere a 5-ton hoist can be installed. In addition, this new Robins product does not injure cars or unloading facilities in any way.

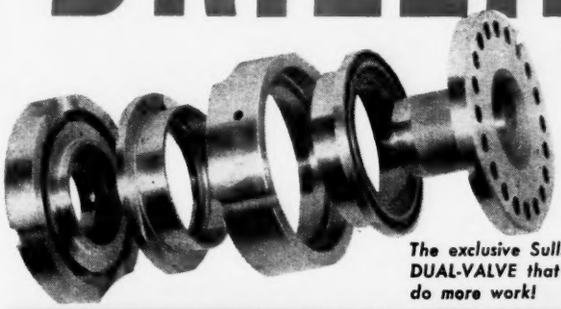
A note or phone call will bring complete literature or a "Job-Engineer" to your desk to give you all the facts on how this exclusive *New* Robins Car Shakeout can help solve your hopper-car unloading problems.

AMERICA'S ONLY *COMPLETE* MATERIALS HANDLING SERVICE

Hewitt and Robins unite to offer you 136 years of combined experience in "Job-Engineered" rubber products and machinery designed to answer any materials handling problem you may have.

ROBINS
CONVEYORS INCORPORATED
PASSAIC, NEW JERSEY
DIVISION OF HEWITT RUBBER CORPORATION

DRILLING ROCK?



The exclusive Sullivan thrifty DUAL-VALVE that makes Air do more work!





SULLIVAN L-47 AIR DRILL

For taking up bottom, brushing roof and all the general utility rock jobs. Has exclusive Sullivan DUAL-VALVE for more efficient operation. 55 pound performance in a 45 pound class drill!

...look to Sullivan...



SULLIVAN L-1 DRILL

Widely used in anthracite properties for drilling both coal and rock. A 30 lb. husky that will stay on the job and do more work in less time.



SULLIVAN L-57 DRILL

For heavy, sustained rock work such as driving slopes and sinking shafts. Has the exclusive DUAL-VALVE that's thrifty because it makes the air do more work!

Wherever there is a rock drilling application in a coal mine, it's logical to look to Sullivan for the rock drill. Sullivan is one of the oldest and largest manufacturers of rock drills and one of the world's leading suppliers of coal mining machinery. No other manufacturer of rock drills offers the coal mine such a complete line or such a combination of background and experience. That's why it will pay you dividends to call the nearest Sullivan office for literature and information when you need rock drilling equipment.

Sullivan Division, Joy Manufacturing Company, Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Company Ltd., Dundas, Ontario.

SULLIVAN

SALES OFFICES IN: Birmingham - Butte - Chicago - Dallas - Denver El Paso - Huntington - Knoxville - Middlesboro - New York - Philadelphia Pittsburgh - Seattle - San Francisco - Salt Lake City - Scranton - St. Louis

SULLIVAN PRODUCTS—Coal Mining Machines - Scraper Haulers - Hoists Rock Loaders - Car Pullers - Air Compressors - Coal Drills - Rock Drills Cutter Bit Sharpeners and Heaters - Core Drills and Contract Core Drilling

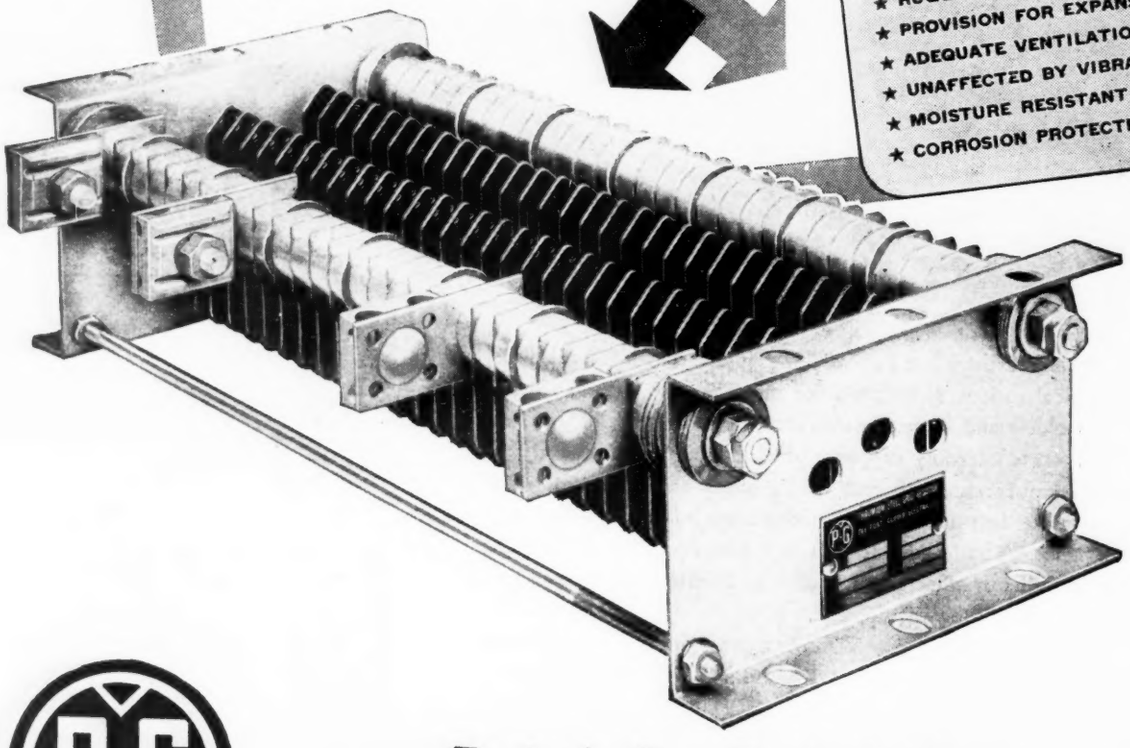
BUILT TO LAST LONGER

where conditions may be *Destructive or Hazardous*

P-G RESISTORS, with their non-corrosive steel resistor elements and mica insulation, last longer under extremely adverse operating conditions. In addition, P-G exclusive floating bolt provision for expansion and allowance for adequate ventilation provide that "something extra" needed for a truly rugged resistor. Neither vibration, nor moisture laden or corrosive atmospheres have material affect on quality of service.

Try P-G Resistors for your toughest job.

- ★ ALL STEEL CONSTRUCTION
- ★ MICA INSULATION
- ★ RUGGED TERMINALS
- ★ PROVISION FOR EXPANSION
- ★ ADEQUATE VENTILATION
- ★ UNAFFECTED BY VIBRATION
- ★ MOISTURE RESISTANT
- ★ CORROSION PROTECTED



P-G

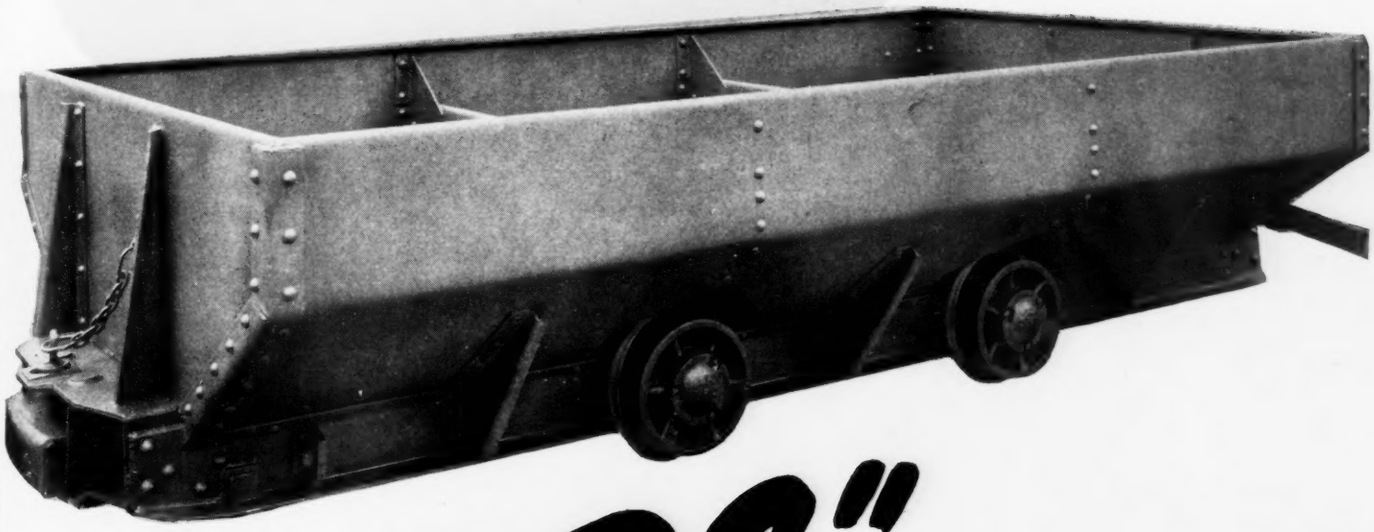
The Nonbreakable Steel Grid Resistor

THE POST-GLOVER ELECTRIC COMPANY

• ESTABLISHED 1892 •

221 WEST THIRD STREET, CINCINNATI 2, OHIO

a.c.f.



"TOPS" IN DROP BOTTOMS!

The unloading operation in a.c.f. Drop-Bottom Mine Cars is automatic—smooth in operation—without stopping the progress of the train. Cars moving without interruption, bring out a lot more coal and at lower cost per ton! All-welded end sill construction and double-action spring bumpers are only a few of the many exclusive features of a.c.f. Mine Cars. Ask our Sales Representative to demonstrate the reasons why a.c.f. is "Tops" in Drop Bottoms!

a.c.f.

AMERICAN CAR AND FOUNDRY COMPANY

New York · Chicago · Philadelphia · St. Louis · Cleveland
Berwick, Pa. · Pittsburgh · Huntington, W. Va.

When is a truck expensive?...

You can measure the cost of a truck *two* ways —and only one is right!

You can go by the price of the truck when you buy—and go wrong. Or you can go by the *cost of the work it gives*—and come out right.

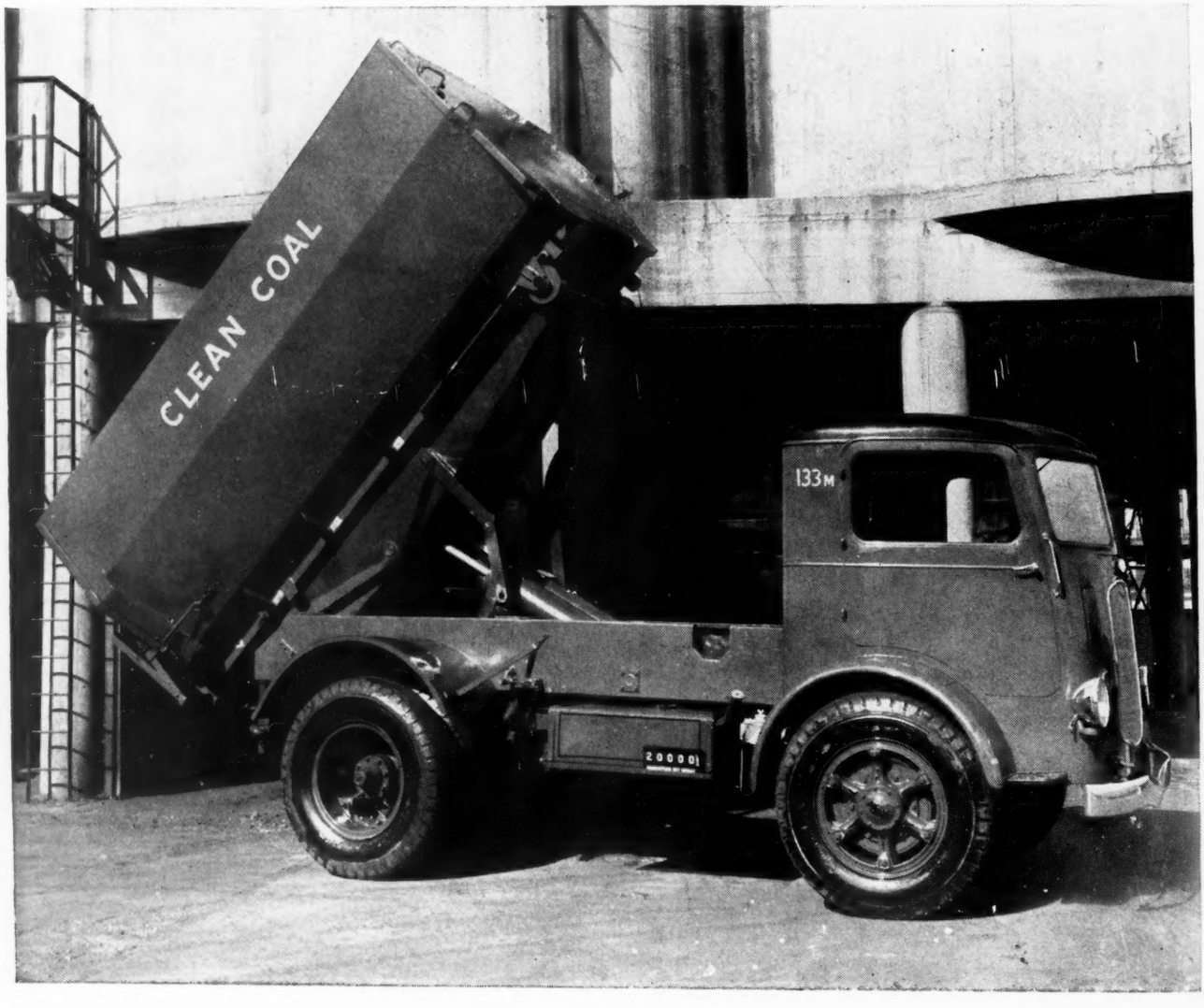
Mack trucks are *workers*. They're *built* that way, clear through. Regardless of their price when new, they're *bargains in work done before they're through!*

Mack case-hardened, generator-ground timing gears are so tough that none has *ever* had to be replaced from wear. That's an example of Mack quality standards and progress . . .

This means *longer years* of work—steadier work, with less time in the repair shop—*more hauling done for less net cost . . .*

The records of thousands of users of Mack trucks over 46 years bear out these facts.

Put a new Mack to work—*and learn what thrifty trucking really means!*



Mack Trucks, Inc., Empire State Bldg., New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE



Performance Counts!



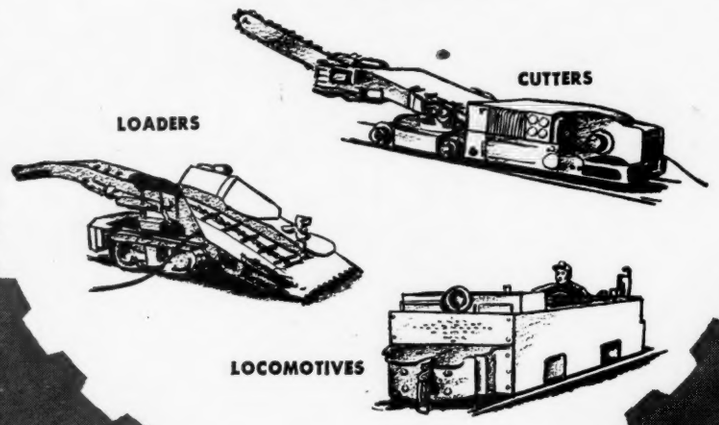
THE JEFFREY MANUFACTURING COMPANY

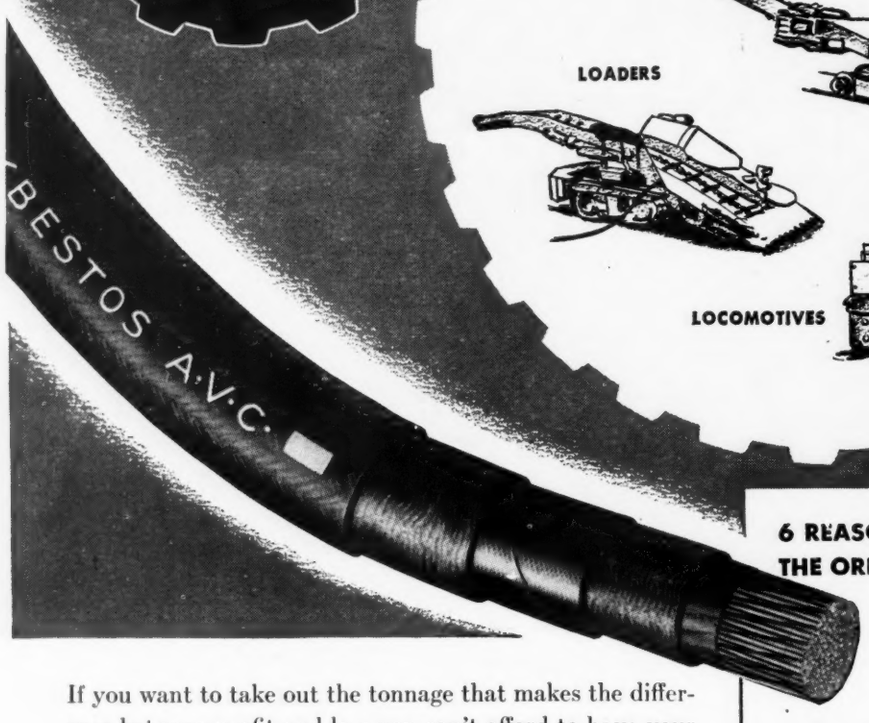
912-99 North Fourth St., Columbus 16, Ohio

ESTABLISHED 1877

ROCKBESTOS A.V.C. MINING CABLE

KEEPS Mining Machines *Mechanized*





If you want to take out the tonnage that makes the difference between profit and loss you can't afford to have your mining machines *loafing* because cable-failures put them on the sidelines.

Cut down *time-out* by using Rockbestos A.V.C. for re-wiring—and make sure you get it in re-built equipment. It's built to operate alongside hot resistor grids and under overloads without drying out or cracking. It won't rot, swell or flow when smeared with oil or grease. It won't burn or support flame. And that's why manufacturers of mining machines have been using it for internal wiring ever since we designed it in 1928.

Keep your cutters, loaders and locomotives *on the job* with Rockbestos A.V.C. and reduce costs and maintenance. For samples and information write to:

ROCKBESTOS PRODUCTS CORPORATION
P. O. Drawer 1102, New Haven 4, Conn.

6 REASONS WHY YOU SHOULD USE THE ORIGINAL ROCKBESTOS A.V.C.

It is made to fit bushings properly.

The impregnated asbestos yarn braid is heatproof, flameproof and resistant to moisture, oil, grease and alkalies.

The felted asbestos insulation beneath, impregnated with heat, flame and moisture resisting compounds like the braid, won't bake out, crack, flow or burn.

Asbestos-protected varnished cambric supplies high dielectric strength and added moisture resistance.

The inner impregnated asbestos insulating wall won't get brittle or crack under conductor-heating overloads and won't burn even if the copper melts.

The paper separator prevents the insulation from sticking to the conductor and makes stripping easy.

This construction is one of 125 developed by Rockbestos for severe operating conditions.

ORDER FROM THESE JOBBERS

BECKLEY, W. VA.	Beckley Mach. & Elec. Co.
BIRMINGHAM, ALA.	Moore-Handley Hdwe. Co.
BLUEFIELD, W. VA.	Superior-Sterling Co.
CHARLESTON, W. VA.	Charleston Elec. Supply Co.
CLEVELAND, OHIO	Upson-Walton Co.
EVANSVILLE, IND.	Evansville Elec. & Mfg. Co.
FAIRMONT, W. VA.	Fairmont Supply Co.
HUNTINGTON, W. VA.	Banks-Miller Supply Co.
LOTHAIR, KY.	Mine Service Co.
MIDDLEBORO, KY.	Rogan & Rogan Co.
PITTSBURGH, PA.	Upson-Walton Co.
	Westinghouse Elec. Supply Co.
SCRANTON, PA.	Penn. Elec. Engineering Co.
WHEELING, W. VA.	Westinghouse Elec. Supply Co.
WILLIAMSON, W. VA.	Williamson Supply Co.

ROCKBESTOS A.V.C.
The Cable with Permanent Insulation

Firestone

Announces

A SENSATIONAL NEW OFF-THE-HIGHWAY TIRE

the Wire Cord

AGAIN Firestone pioneering leads the way with another epochal development — THE FIRESTONE WIRECORD Off-the-Highway Tire.

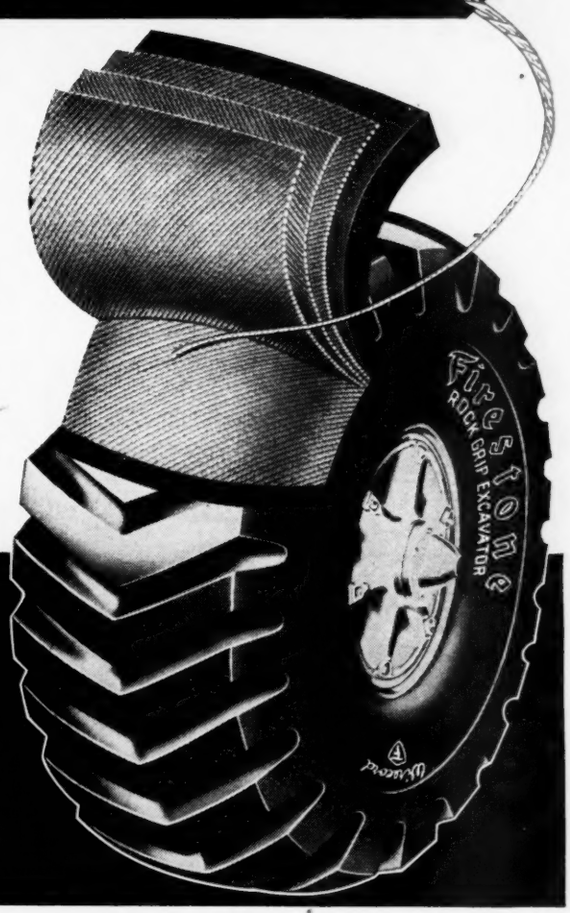
In this, the strongest tire ever built, the body cords are twisted strands of wire. Every cord in every ply is five times as strong as the strongest cord heretofore used.

This cooler-running tire takes unbelievable punishment without blowing out, puncturing, or failing from any of the causes that ruin ordinary tires prematurely.

FIRESTONE WIRECORD Off-the-Highway Tires are now proving their superior performance in logging, strip-mining and other operations where the vehicle is forced to travel over rough roads under heavy loads.

Although not yet in volume production, this amazing new type tire is another example of Firestone's leadership in bringing you the Best Today . . . Still Better Tomorrow.

Copyright, 1946, The Firestone Tire & Rubber Co.



Firestone
Wire Cord
OFF-THE-HIGHWAY TIRE



WHERE'S THE HUMAN ELEMENT

I-T-E Automatic Reclosing Circuit Breakers perform with *better-than-human* economy, accuracy and dependability in opening overloaded circuits and reclosing legitimately loaded circuits. Human attendance is required but periodically because this equipment automatically anticipates and controls electrical disturbances arising on the load circuit. The increased use of automatic reclosing circuit breakers conforms to mine mechanization and permits saving of substation attendance for more important duties elsewhere.

Today's I-T-E Automatic Reclosing Circuit Breakers, the result of over a quarter century of coal mining experience, set the standard for performance, dependability and saving in mine service. Write for complete information, Bulletin 2503, or contact the nearest I-T-E engineering representative if your problem is urgent. I-T-E Circuit Breaker Co., 19th & Hamilton Streets, Philadelphia 30, Pa.

I-T-E AIR SWITCHGEAR



HAULS GIANT LOADS



. . . but GENTLE to Tires and Roads

Non-Spin Traction . . . Less Unsprung Weight reduce road damage and tire wear

It is not the size of the load that damages tires and roads. *It's the riding qualities of the truck that count!* Even light loads cause heavy damage when truck wheels bounce, jounce, pound and scuff.

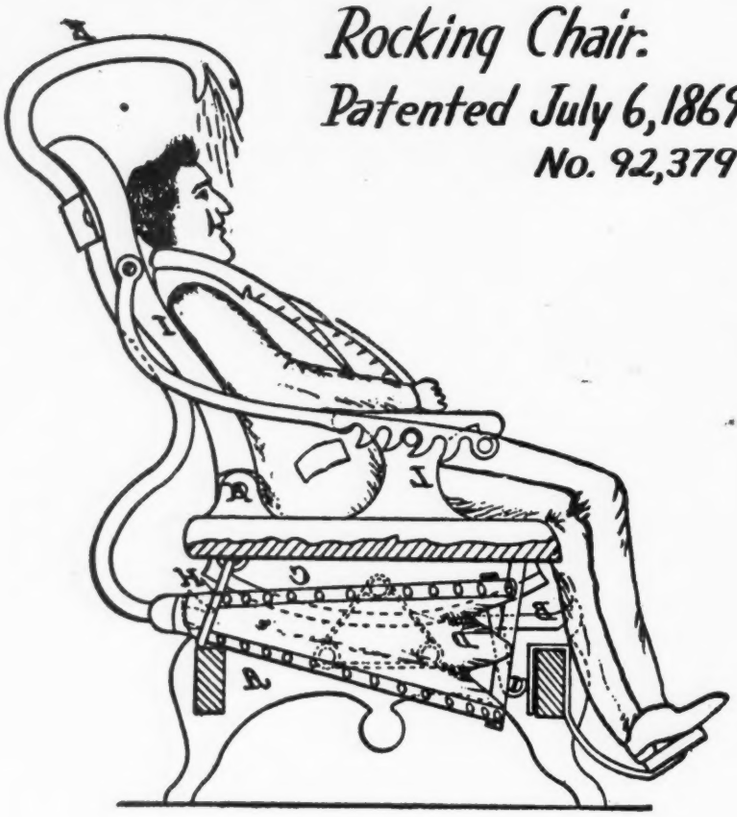
That does not happen with Walter Tractor Trucks. Hauling 60-ton payloads of coal or 20 cu. yds. of overburden, Walter Tractor Trucks regularly show greater tire mileage and less road damage than any other truck.

This is achieved by two important design features. First, the Walter Four Point Positive Drive eliminates wheel spinning, therefore prevents grinding down treads and gouging roads. Second, the Suspended Double Reduction Drive is mounted *above*, not in, the axle, reducing the unsprung weight that causes rebound. This cuts down the bouncing, pounding and overheating of tires because they follow the contour of depressions and bumps without losing contact.

In addition to lower tire and road wear, you gain greater traction and speed, higher tonnage and lower hauling cost per ton from Walter Tractor Trucks. Learn more about these and other advantages Walter Tractor Trucks offer. Write for detailed literature, today.

WALTER MOTOR TRUCK CO. 1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

WALTER TRACTOR TRUCKS



Rocking Chair.
Patented July 6, 1869
No. 92,379

FAMOUS U.S. ISSUED PATENTS No. 1

Now wasn't this "Improved Rocking Chair" the berries? But our guess is, it lost out to the electric fan.

This improved invention relates to improvements in the construction of rocking-chairs, with air-blowing attachments, having for its object to provide a stand or base for the support of a bellows, with tracks or rails, on which the rockers, which are fixed close to the seat, may work, instead of on the floor; also, to provide an arrangement whereby the occupant may, by the act of rocking, impel a current of air upon himself, through a flexible tube, which may be directed to any part, as required.

Ye Old Rotary And End Dump Cars Will Soon Be As Scarce As "Rocking Chair Blowers"

The efficiency of modern S-D 1-2-3 Automatic mine cars, compared with many old-fashioned mine cars now in use, is about as different as a modern electric fan compared to the "Rocking Chair Blower" shown above.

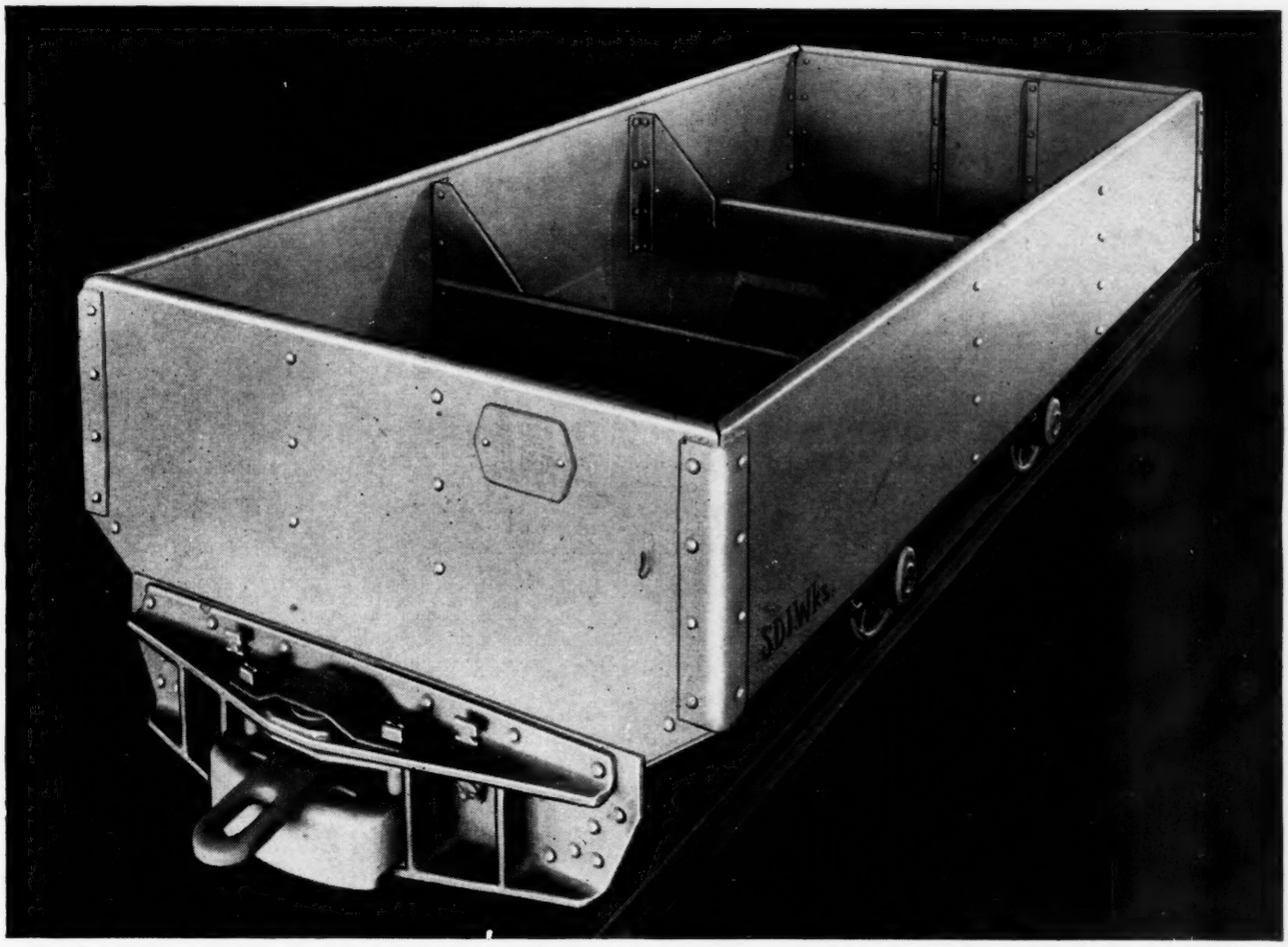
Go to any mine using S-D 1-2-3 "Automatics" and you will find this out for yourself. If they happen to be equipped with our new Jerk-Out unlatching device, you will see something really good. This new device, that works underneath the bottom of car, unlatches two separate hooks automatically. You also have double safety feature with the two hooks. No more do you need have latch lever bars, to get bent, on the outside of your cars.

How would you like for us to send you some case histories of actual installations of S-D 1-2-3 "Automatics" replacing Rotary and End-Dump cars and proving from the books of the Mining Companies that the change-overs have saved anywhere from 25¢ to 50¢ per ton of coal handled?

"WE LIKE TO MAKE SHIPMENTS LIKE THIS

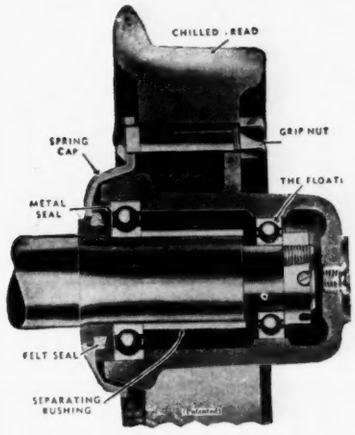


Sanford-Day Iron Works, Knoxville 9, Tennessee



How would you like to lease these cars, at an annual rental cost which, over a 15 year period, would average 2¢ a ton? You have no initial outlay for these cars. Also, we keep the cars in good working order as long as the cars last. Finally, the big part of the rental applies to reduce the purchase cost and you can stop renting and buy them any time you feel like it.

This is a proposition where you have everything to gain and nothing to lose. Let us hear from you.



Here is the magic wonder wheel—the S-D "Floater" Ball-Bearing Wheel. We believe it is the most economically operated mine car wheel in the world. We guarantee in writing that your greasing expense will be limted to one greasing in five years. Check this with your present cost of greasing wheels.

ON MONDAYS, WEDNESDAYS AND FRIDAYS".



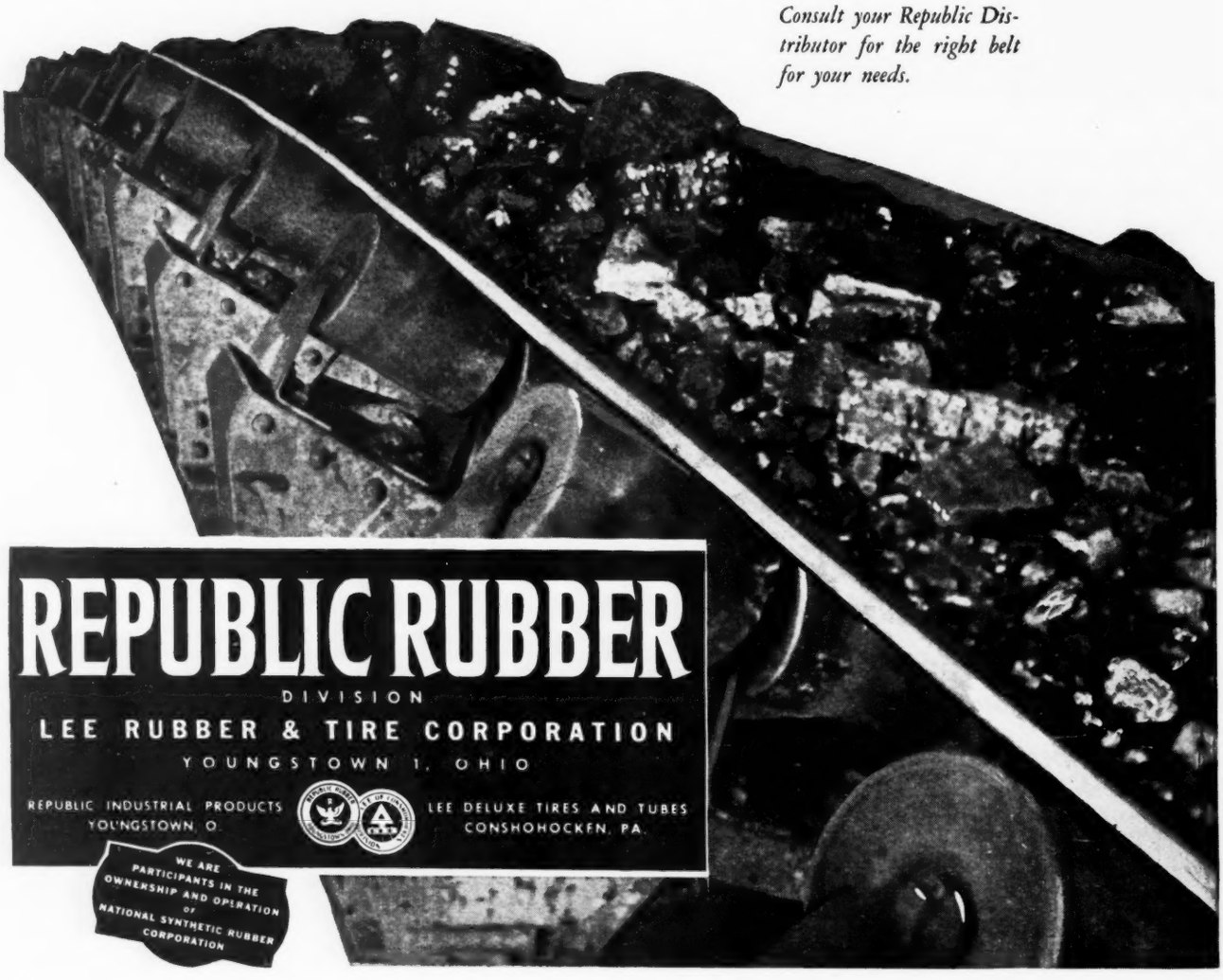
Sanford-Day Iron Works, Knoxville 9, Tennessee



THERE'S A RIGHT GRADE OF COAL AND A RIGHT *Republic Conveyor Belt* FOR SPECIFIC REQUIREMENTS

Efficient consumption, maximum economy in the use of coal calls for the right grade for the specific requirements. And in the same way, conveyor belting has to be built for the particular service conditions to attain the goal of all such operating equipment—lowest cost per ton hauled. Recommended types and grades of Republic Conveyor Belting have, for many years, been providing this peak performance in the nation's mines. On heaviest installations, giant Super Excelo Reprene belts have repeatedly demonstrated highest resistance to abrasion, cutting, tearing, flexing and aging. Other Republic constructions have set their own records of low-cost tonnage under conditions to which they are particularly adapted.

Consult your Republic Distributor for the right belt for your needs.



REPUBLIC RUBBER

DIVISION

LEE RUBBER & TIRE CORPORATION

YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS
YOUNGSTOWN, O.

LEE DELUXE TIRES AND TUBES
CONSHOHOCKEN, PA.

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

AMERICAN
CYANAMID & CHEMICAL CORPORATION
EXPLOSIVES



Origin of your blast....

THE EFFICIENT blasts that bring down thousands of tons of properly sized coal—with AMERICAN Explosives—are the result of intensive laboratory research, followed by close chemical control, thorough inspection and unremitting care in manufacture. There is a grade of AMERICAN Explosives and blasting caps suited to any requirement.

• *Capable field engineers are available at your call.*

★ **HIGH EXPLOSIVES**

★ **PERMISSIBLES**

★ **BLASTING POWDER**

★ **BLASTING ACCESSORIES**

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

EXPLOSIVES DEPARTMENT

SALES OFFICES: PITTSBURGH, Pa. Bluefield, West Va. Scranton, Pa. St. Louis, Mo. Chicago, Ill. Pottsville, Pa. Hazleton, Pa. Maynard, Mass.



If it's TWINS you want it's TWINS you'll get . . .

Specify genuine JOY replacements

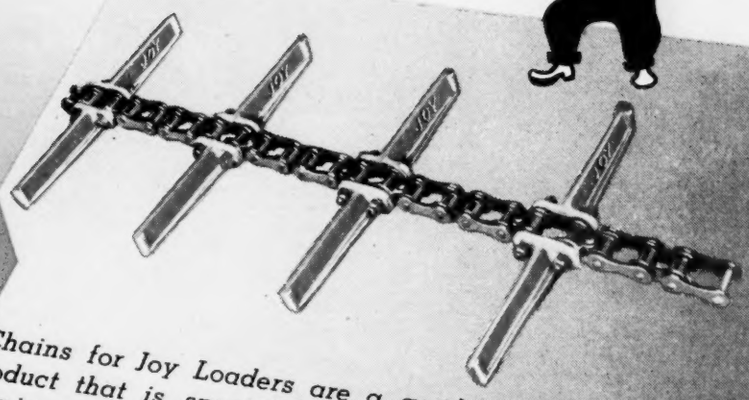
There's no guesswork about the fit and load-carrying ability of genuine Joy factory engineered parts. Each is precision made to carry its correct share under the most unfavorable operating conditions. You'll find it best to insist on genuine Joy factory-made replacements. Substitution of "pick-up" parts is dangerous—may lead to further breakdown of other equipment.

They're factory engineered to fit properly for long, hard usage.



Look for the name

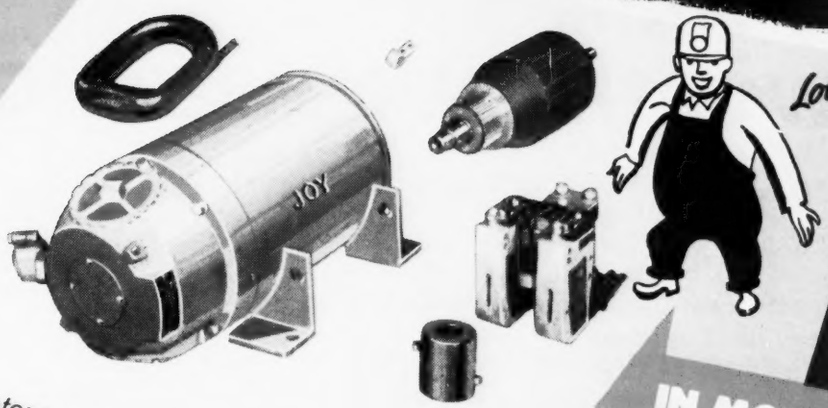




IN CHAINS AND FLIGHTS

Chains for Joy Loaders are a good example of a Joy product that is specially engineered for difficult load carrying conditions. They're extra-strong and assure long, trouble-free operation when moving the heaviest tonnages.

Look for the name



IN MOTOR PARTS AND CONTROLS

Since motors and controls are the very heart of Joy mining equipment it's doubly important that replacements for these be the best obtainable. Genuine Joy replacements work best, for they're specifically engineered for your Joy equipment.

the Services of a Joy Engineer are at your command



JOY MANUFACTURING CO.

FRANKLIN, PA.



A NAME WORTH REMEMBERING



Proved and approved . . . popular in strip pits . . . White Charter Oak is the Safety Fuse you'll want for your secondary shooting.

Flexible, with a hard, white finish, White Charter Oak — though not intended for wet work — will meet your needs fully and economically when conditions are dry or damp.

White Charter Oak Brand is worth remembering as the fuse best suited for nearly all your work. The Explosives Company representative serving you will be glad to discuss this with you — or write us.

S-25

ENSIGN-BICKFORD *Safety Fuse* **SINCE 1836**

Also Primacord-Bickford Detonating Fuse

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONNECTICUT

"First in Fusing a Safer America"

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Coal Age

APRIL, 1946

Ivan A. Given, EDITOR

Milestone

THE MARCH meeting of the National Coal Association will go down in history as marking a change from the defense to the offense in the retail distribution of bituminous coal. True, some work already has been done in that direction but it has been spotty and too often not directed at the big problem: helping the retailer render a real service that will build good will and nail down business for coal and the coal industry. The action of the association in approving a concrete plan and—more important—voting the money to put it into operation means an end at last to the all-too-general tendency to forget the product when it leaves the loading boom and pass the buck to the retailer and the equipment dealer—a tendency that too frequently has left the user holding the bag in the past.

The case made for the plan by the association's marketing committee (see this issue's news section) does not, by any means, overstate the importance of the problem. Retail sales are responsible for 30 to 35 percent of the income of the industry and the home owner's basement is the special target of competition. By cooperative advertising, by greater pressure on equipment sales and—above all—by making available to the user a centralized 24-hour service on all heating and equipment difficulties and problems, bituminous coal, backed up by research, can and will lick competition. The plan is made, the money is provided. It will not fail if every operator gets behind it. In succeeding, it will guarantee bituminous coal the continuation of one of its most profitable markets.

In the Middle

NOT UNEXPECTEDLY, the National Labor Relations Board has approved organization of coal-mining supervisors by the United Mine Workers of America—the decision coming at the right time to best reinforce Mr. Lewis' demands in the bituminous wage negotiations. The board was not unanimous, however, and Gerard D. Reilly's dissent contained some shrewd observations not only on the wisdom of subjecting management to organization but on what might happen to supervisors themselves. In this latter connection, Mr. Reilly took as his text an editorial from the May, 1945, issue of the *Railroad Workers' Journal*, reading in part as follows:

"If the title of 'foreman' means what it actually implies—the right to hire, discharge and discipline employees for insubordination—then I do not hesitate in saying that a foreman should not be organized. How can a man be honest with himself and honest with his union if he is forced, through a condition of unionism, to play both ends against the middle? And this is exactly what he must do as a unionized foreman. If he does not discipline insubordinate employees he can be expelled from the company for his own insubordination and if he does discipline as a conscientious foreman he can be expelled from his own union, which places him RIGHT IN THE MIDDLE!"

Anyway it's sliced, there is little good that can be said for organizing supervisors.

Opportunity Lost

APRIL 1 brought another stoppage in bituminous mining—largely, it appears, because John L. Lewis wanted it. Although the operators had difficulty in finding out what Lewis had on his mind they nevertheless offered substantial concessions that should have led to a decision without a stoppage. In other words, there was real basis for collective bargaining had Lewis been interested in collective bargaining. Instead, all the evidence points to the fact that he did not want to settle without a stoppage—presumably on the theory that the resultant public fear and distress would provide him with a club to force a settlement more to his liking.

Whatever the outcome may be, the aftermath will be a feeling of regret that another opportunity was lost—an opportunity to prove that work stoppages and higher prices are not inevitable accompaniments of contract making in coal mining. Of the two, the public probably is less tolerant of interruptions in service, although, in view of the competitive picture, increased prices to consumers are scarcely less serious. Yet, the stoppage already has taken place when there was every reason to negotiate, and the higher costs apparently are on their way unless the operators can find other means of offsetting new wage concessions—a race in which so far they have been bested by the union leadership. If the outgrowth of the present situation is harder competition for coal and a curtailment of available working time for the miner, the lion's share of the responsibility rests with Lewis.

Meeting the Future in Coal Mining

• How the Competitive Problem Looks
• How Coal Is Fixed to Handle It

IS COAL MINING in for the deluge when the present reconversion demand tapers off? Hardly, in view of everything now known. In fact, compared to the "bad old days," coal mining is doing rather well and should continue to do so. But a favorable outlook does not conceal the fact that a few problems—notably cost and competition—still remain.

How well is coal mining organized and equipped—physically, philosophically and otherwise—to solve these problems, take advantage of present opportunities and make new ones? It probably can be fairly said that the difference between moderate and complete success in the future depends upon the ability and enterprise the industry shows in analyzing its problems and in taking steps to eliminate any weaknesses such analysis shows.

Every man and every manager has a part in this analysis and in developing a program that will convert possibilities into actualities by rendering improved service to the public. The miner, to start at that end of the chain, is not exempt. He should know the industry's problems and be prepared to help it and himself by lending his talents to the cause of higher efficiency and by foregoing attempts to force wage rates to uneconomically high levels with adverse effect on coal's ability to compete and give employment. Operating management—whether boss, superintendent or operating vice president—must seek new and more efficient equipment and methods and get more out of existing facilities. Executives and directors must provide the operating departments with the best in mining and preparation equipment and lend support and cooperation in the promotion of efficiency, quality and safety. Sales officials must study ways and means of increasing coal use and keeping customers happy.

To repeat: How well is coal organized to do these things in the future? Pretty well in some respects; not so well in others. Duly recognizing the difficulties inherent in such a project, the following will attempt to present the score both for and against coal mining. Incidentally, it is more favorable than not—a tribute to the real effort that has been put forth in the past decade or two.

Competition: No. 1 Coal Problem

What the other fellow has to offer, how he offers it and how the customer responds have been matters of critical interest to coal mining for many years and bid fair to become more so in the future. Oil is the big villain in the coal man's book, followed by natural gas and hydro-power. Hydro-power hasn't been doing quite as well as the others and has hit coal largely in industrial applications, although it has cost it some domestic and other loads. Natural gas strikes primarily in the vital domestic field, where realization usually is the greatest. It also has dipped into the power and steam-raising field.

Oil, on the other hand, comes up against coal in a far wider range of applications. Where coal feels oil the most, however, is in its new form of diesel fuel in the railroad field—one of coal's major outlets. Aside from coke-making, coal encounters competition perhaps the least of all in public-utility generation of electricity. Unless price gets too much out of line—which it could do—coal can expect to retain its present lion's share of the utility business and quite likely increase it.

Statistically, the picture shows production of petroleum rising faster than coal in the past several years. The growing fuel-oil and diesel fractions, however, reflect losses by coal in the industrial, domestic and railroad fields, as well as certain others. As previously pointed out, fuel oil has not done as well as coal in the utility field. Neither has natural gas, although the fact that its production also has risen faster than coal in late years is another indication that it is costing coal domestic as well as industrial business and threatens to become an even tougher competitor in the future.

Why have competitive fuels and energies been able to do relatively better than coal in many fields in the past ten or twenty years? There are perhaps several reasons. Cost is the big one, but competition also has made gains because of:

1. Its nature—liquid, gaseous or electric—thus more convenient, cleaner and "glamorous."

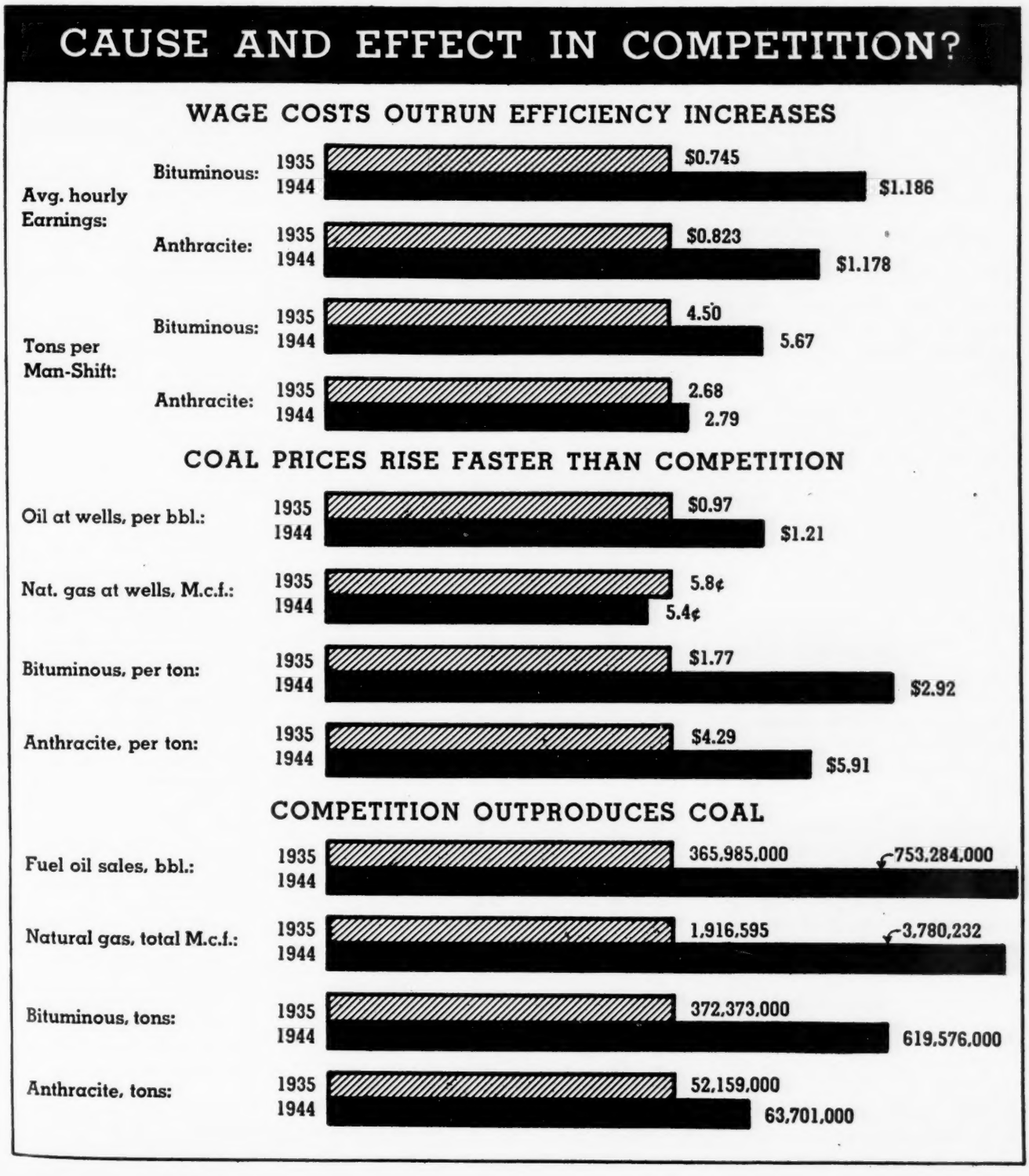
2. Deficiencies in coal-burning equipment and methods. Oil and gas have, very smartly, promoted the use of modern, efficient automatic equipment, while much of that using coal, especially in the domestic field, is antiquated, hand-fired stuff with a very low efficiency. In the railroad field hand-firing has largely disappeared but the average steam locomotive still is 25 years or more old, is much less efficient than conventional locomotives now being built and does not have the service "availability" of its competitors.

Much more could be said on the subject of design of equipment for burning coal as compared to that for burning oil,

but despite outstanding advances, such as the automatic stoker, the new smokeless stoves and the anthracite "heat jeep," coal is suffering because equipment for burning it does not compare with equipment using the competitive fuels.

Where only cost is involved, as in the public-utility field, coal always has been able to beat competition, and still is. The margin, however, because industry efficiency has not kept pace with wage increases and increases in the cost of other materials and equipment, is not as great as it was. If further substantial rises in wage and other rates should take place without offsetting increases in mining efficiency, all the evidence indicates that coal would be getting into much more dangerous waters, since oil and natural-gas prices are not so responsive to similar increases. In short, increased mining efficiency and restraint in forcing up wage costs are more vital than ever—not only to management but to men.

Cost, however, while a major factor in consumer thinking, often is rated below other factors, provided the fuel offering the added advantage desired by the user is not excessively high in price. Thus, the householder is likely to look for greater convience even if it costs him a little more, and the railroads cite locomotive "availability" as a big reason for buying diesel power. But if, as seems



in prospect, a much more efficient coal-burning locomotive becomes available the cost advantage will be so great that even its "glamour" will not save the diesel. And if coal were gasified or liquefied at competive or lower prices, it could meet oil and gas on equal terms in the home owner's basement. Further, if it were used to raise steam in a central plant, it could offer even more convenience for no more than the previous cost of oil and gas, and probably less.

Summing up, perhaps at the risk of some over-simplification, the competitive situation boils down to about the following:

1. Oil and gas can be even tougher opponents in the future, with hydropower an added starter.
2. Coal still can lick the others where cost of energy is the sole or predominant factor, although higher wage rates and material costs have reduced its margin and can reduce it further unless additional increases are offset almost immediately by increased efficiency.
3. Where convenience, cleanliness and other similar factors enter in, coal still is at a disadvantage in competing with the "glamour" fuels, although work in developing and promoting new, more convenient and more efficient burning equipment has reduced that disadvantage a little, with cost helping out.

The future is not a bed of roses, but neither is it a bed of thorns. The opportunities are there and coal wants to take advantage of them. How well is it equipped and organized to do so? Some views on that are the subject of the following material:

Industry Organization: Satisfaction and Handicap

What, for want of a better term, might be called the "organization" or "structure" of the coal industry offers both advantages and handicaps, although they probably are no more prominent than in many other businesses. The industry is made up of a large number of relatively small operations, the majority of which, excepting captive and a few large commercial organizations, are locally or individually owned. No one company or group of affiliated companies controls more than a small percentage of the producing capacity, in contrast to, say, steel or oil. In other words, coal mining is largely an individualistic undertaking and more than any other basic industry offers all the satisfactions and freedoms of direct, personal operation. In coal mining the individual still is largely the architect of his fortunes—with all the advantages and disadvantages that connotes.

Since coal mining consists of a large number of enterprises under different ownership, most of which are in severe competition in one or more common markets in normal times, and since seasonal fluctuations in demand make it necessary to provide considerable overcapacity, coal has had real difficulty avoiding a natural tendency to resort to selling at a loss to keep mines in operation. The same factors also have militated against formation and maximum utilization of industry-wide organizations for such necessary purposes as research, public relations, advertising and negotiation of contracts, as well as others. Yet the fact that progress has been made in spite of these difficulties is one of the most hopeful signs to be considered in planning for the future.

At the moment, prevailing conditions have reduced the magnitude of some of the industry's problems—price stabilization for one. But it nevertheless remains a difficulty, even though less prominent at this time. Of the several courses available a few years ago, the bituminous industry took that of federal regulation and anthracite that of production control. The future undoubtedly will bring the problem to the fore again and "organization" of the industry again will become a factor.

Since production control and allocation worked satisfactorily for anthracite it seems logical that they will be continued. Bituminous, however, probably will have to choose whether it will again solicit federal control, hoping to get the best terms possible, or whether it will retain maximum freedom over its actions by getting maximum efficiency and then refusing to sell without a profit.

The problem admittedly is difficult, however, and coal, because of "organization" and capacity considerations, may have to accept federal jurisdiction over prices and marketing policies, since antitrust statutes bar private cooperative action. These statutes, however, do not prevent cooperation in research, public relations, advertising and the like, and some real opportunities lie in these directions. By contributing to the support of organizations carrying on these activities and by taking an active part in the programs all producers have an opportunity to cash in on the opportunities that exist without loss of individual freedom and discretion.

The structure of the industry, plus the extra capacity it has to carry, tends, as stated, to lead to excessive competition on the price front. But with it comes a high degree of freedom of action. The problem is to preserve that freedom of action by cooperative effort in promoting coal acceptance and utilization, more harmonious labor relations and other legitimate goals and, if possible, avoiding regulation from the outside by observance of sound business principles. It is virtually axiomatic that

BUILDING MINING PROSPERITY

THE NEEDS:

1. Greater cooperation between units in the industry in research, public relations, advertising, contract negotiation and other vital activities.
2. Preservation of reasonable profit margins by refusal to engage in unnecessary price competition.
3. Higher efficiency and lower cost through (a) enlistment of employee cooperation and interest and greater use of incentives; (b) wider installation of mechanical-mining equipment; (c) increased output per man and per machine through better operating methods.
4. Better public opinion through industry-wide, local and individual public relations.
5. Better merchandising in its fullest sense of doing everything and anything to promote convenience, economy and satisfaction in coal use.

THE REWARDS:

1. Improved standing with the public.
2. Less competition.
3. Higher efficiency and greater production.
4. Better wages, salaries and profits.
5. A more prosperous industry in the future.

You-Being Equal to the Task-Work Every Day You Can

What is the future of *anthracite?* How can reduced consumption, depressed working time and reduced living standards which followed in the wake of World War I be averted in the *anthracite industry* when normal competition as between fuels returns? These are twin $64 economic questions that only diligent endeavor on the part of *the industry* from the biggest operator on down to the *lowest paid employe* can answer.

Representatives of the U.M.W.A. who have canvassed the situation are convinced that *anthracite* coal can hold its own and march forward with other *industries* if the fullest cooperation as between employer and employes is promoted and maintained.

In every phase of *anthracite* production and preparation a day's work must mean a full day's work for *all employes* in keeping with established custom. Absenteeism must be reduced to absolute sickness and unavoidable circumstances. Unnecessary lay-offs must be curbed. Every foreseeable delay in a continuous flow of supplies and materials that would retard production must be anticipated and met by management.

Community booster meetings and press releases are good auxiliary aids, but cannot supplant wholehearted cooperation within *the industry* to maintain and increase production.

The *anthracite industry* must put its own house in order if a recurrence of the *economic pitfalls* following World War I are to be avoided. Certainly, no one in the *anthracite industry* wants a return of an uneconomic three- or four-day work week.

Decreased per man day production means increased costs. Increased production means lowered costs. Every *individual member* of the U.M.W.A. knows full well whether he can increase his daily production. Every *individual employe* has an obligation and a duty to make every contribution possible in keeping with the terms of the wage agreement—to execute his best *productive efforts.*

The time to prevent a return of *economic chaos* in the *anthracite industry* is now. Everybody must pull together to maintain and increase production.

This Advertisement Sponsored and Paid for by Anthracite Districts 1, 7, 9 and the International Union, U. M. W. A.

NEW RECOGNITION OF KEY PROBLEM—Reflecting the vital importance of selling the miner on increased productivity as a means of promoting industry progress, the United Mine Workers has come to the aid of the anthracite operators with advertisements such as this appeal for higher output per shift.

when an industry as a whole is doing well most of its individual members likewise do well. Therefore, any contribution an individual can make to the general welfare also betters his own immediate and future chances.

Higher Efficiency: Vital for Progress

While convenience, as previously pointed out, is a factor perhaps more important than cost in certain important coal markets, cost still is not wholly ruled out even in these. In others, representing the lion's share of the business, it is the predominating or sole factor. In speaking of cost, cost to the consumer is meant. Naturally, it involves a number of elements over which coal can exercise little or no control. These include freight rates, dealers' margins and similar changes assessed against a ton of coal before it finally lands on or in the consumer's premises, plus also, in many cases, a few charges for handling, ash disposal and the like afterward. But the mining industry, rather than the intermediaries, usually gets the blame and for no good reason, unless it is because it has failed to acquaint the consumer with the facts.

When it comes to the part of the ultimate cost to the consumer for which the operator is responsible, what is the picture? First off, mine costs and prices have gone up pretty steadily for a number of years and now threaten to establish new all-time highs. Principal reason: output per man per shift or per hour has not increased as fast as wage rates and materials costs. Output per hour has, in fact, dropped recently in the bituminous industry although output per shift registered an increase, due partly to more working time. In anthracite, the increases in late years have been influenced not only by more working time but also by a major growth in stripping, dredging and bank operation, whereas efficiency underground, which may be the critical factor in the relatively near future, has lagged materially in the same period.

Modernization Has Paid

It should not be inferred from the preceding that coal mining has done nothing to offset increased costs by higher efficiency. Far from it. There is good reason to believe that the millions of dollars and barrels of brain sweat poured into modernization and more efficient operation have prevented bituminous mine prices from reaching an average of at least $1 a ton higher than that now prevailing and also have prevented a substantial extra rise in anthracite. Wages and other costs, however, seem headed for another boost. Even if they were not, it still would be highly desirable to offer the lowest mine price possible. What, then, are the prospects in that direction?

The answer to that question involves more than just machinery alone. It also takes in men and management. Perhaps that is not the proper order but both have an equal stake in the prosperity of the industry. Both, to do well what has to be done, should know their jobs and strive to handle them better. Considering management first, the picture is now complicated by attempts to take over the foremen and thus make it more difficult for management to function as it should. That is a development on the debit side, along with the fact that the industry is not yet fully conscious of the importance of well-equipped management in the fields of production, labor relations and related mining activities. On the credit side is the fact that a great deal of work has been done to make management more efficient. Intensification of that work, now the order of the day unless the attempt to split management goes through, should result in an improved picture in both

productivity and relations with employees.

Working forces also have responded to better management and improved understanding of the responsibility of the miner. Nevertheless, all too many workers still are not sold on the industry, on its management and on the necessity of pitching in to make a good thing out of coal mining and thereby a good living for themselves. Will they get the idea without help? Perhaps, but not as soon and not as wholeheartedly as if they had a little assistance. Management is the logical source of that assistance and in giving help it need not feel it is wasting money or babying men.

Incentives Aid Production

When incentive is added to understanding and a desire to cooperate, the stage is set for maximum production. Incentive is not a matter of cash and, in fact, until management has exhausted all other possibilities—which state is yet to be reached in coal mining—cash incentives are more likely to be a liability rather than an asset in the long—or even short—run. But there are other equally if not more powerful incentives:

1. Increased working time and earnings per year through higher efficiency.
2. Competition between crews and mines, which makes itself felt through the natural human desire to excel or be a member of the winning team.
3. Recognition of achievement—praise for a job well done.

Some work has been done in these directions but a great deal yet remains. Is it worth while? Very much so, according to the experience of a growing list of mining companies. It is logical that an interested enthusiastic man with an incentive to do better is a real asset in raising efficiency and increasing running time.

Machinery is the second major avenue to lower costs and lower mine prices. Here again the record has both its bright and dark sides—bright because the industry is adopting mechanical-mining equipment at an unparalleled rate, and dark because in too many cases the efficiency-raising possibilities of such equipment are not being realized to the fullest. Here again, also, the burden falls on management, and numerous reports of greatly increased tonnages per machine and per man-shift are evidence supporting the contention that there is a great deal to be done in the direction of better utilization of equipment—both old and new—thereby getting better utilization of manpower.

Better management is, in fact, the major key to higher efficiency and lower costs. It makes itself felt in installation of new and improved mining equipment, in the promotion of employee interest, understanding and cooperation, in utilizing available incentives to the fullest and in constant search for and utilization of methods assuring maximum results from equipment—new and old—in service. Some idea of the possibilities where top and operating managements work along these lines is afforded by such reports from long-time mechanized properties as the following: tons per manshift, 1943, 5.26; 1944, 6.54; 1945, 7.31, and still rising.

Public Opinion: Asset or Liability?

Coal mining's war record, although marred by work stoppages, plus the public-relations work carried on in recent years, has reduced, among other things, the frequency with which the terms "sick" and "backward" are applied to coal mining. But is the industry out of the woods yet? The answer is no. However, experience to date indicates that the methods and facilities already in existence, if backed up by necessary support, will do the job.

Old but worth repeating is the axiom that the public likes to do business with industries that it feels are well run, efficient and going places. A number of things enter into that opinion, including impressions as to living and working conditions for employees, earnings, steps taken to reduce accidents; managerial alertness, progressiveness and ability; continuity of service, use of modern equipment and methods, development of new products and applications, etc., plus the product itself. Coal qualifies in all these respects and should not have to labor under the burden of impressions epitomized in "sick" or "backward."

Fortunately, a start has been made on presenting the facts necessary to correct misunderstanding and acquaint the public with the true picture of the industry and its accomplishments. More support, making it possible to intensify the work, is the major need at the present time. Equally important is local work to reinforce the industry-wide programs. In this every man in the industry can play a part, first by acquainting himself with the facts, passing them on to those in his charge and personally doing a job of public relations himself and urging others to do likewise. The opportunity exists and individual and group effort will pay off handsomely.

Merchandising: Final Payoff in Mining

Holding customers, getting new ones and securing a price that will permit a reasonable profit is the function of merchandising. It is the last link in the chain that begins with efficient mining and quality preparation. It is in part influenced by both the latter, since a low-cost well-prepared coal helps the sales department clear the first hurdle in the race for business. Where preparation is concerned the picture again is bright and dark. A large amount of new and more efficient preparation equipment has gone in during the past ten years, but there are possibilities of such things as heating service, conversion of coal into gas or liquid fuels and central or district heating (*Coal Age*, March, 1946, p. 66) which offer increasing convenience, cleanliness and smoke elimination.

The growing list of fuel and service engineers is evidence that helping the customer choose the right coal and use it properly is a great aid in merchandising. The industry still has quite a distance to go in that direction as well as in the directions of preventing interruptions in supply and improving relations between its representatives and the consuming public. Realization of that fact has resulted in one of the most forward steps in bituminous history this year with the approval of a cooperative producer-dealer marketing program at the March meeting of the National Coal Association. Details of the plan are given in the news section of this issue. Backed up by individual support and hard work, this plan will go far toward plugging one of the biggest gaps in bituminous merchandising.

To better fit it for the job ahead, coal merchandising must be broadened and strengthened to take in more than just "selling" in the usual sense of the word. With higher efficiency, higher quality and improved relations with the public, better merchandising will complete the chain that means consumer satisfaction. That chain, analysis shows, is a little weak in spots but greatly strengthened as compared to its condition only a few years ago. It will become even stronger as management and men move to cash in on the opportunities ahead.

PLANNED STRIPPING

Helps Modern Units Produce Efficiently

Uniform Tonnage Marks Planning and Streamlining at Pyramid Strip Mine—Drainage and Drilling Promote Efficient Operation—Haulage and Electrification Planned for Maximum Flexibility and Safety

CAREFUL PLANNING for a uniform tonnage is the watchword at the Pyramid strip mine of the Pyramid Coal Corp., Pinckneyville, Ill. Among its other achievements, this operation pioneered the use of oil-well-type rotary overburden drills and combined overload and ground protection for the electrical system. Other operating features include temporary surface reservoirs of considerable size as part of the drainage system; addition of a counterbalance to one of the stripping shovels to permit using a larger dipper; a dual haulage system; and daily consultation on management over the luncheon table.

Output 6,000 Tons Daily

The Pyramid operating plan is based on a daily streamlined production of 6,000 tons of washed coal, including the lump, which is reduced to a top size of 7 in. This is prepared in a McNally-Pittsburg wet washing plant with a capacity of 850 tons per hour. Shipment is over the Illinois Central and Missouri Pacific railroads, each of which has switching connections with the mine yards.

With production set well below the peaks of past performance and scheduled for an even flow of coal over the year, based on 50 five-day weeks, some economies in production are made possible. The car supply is a predetermined figure that the railroads know they must meet every day. There is an even flow of coal through the preparation plant, so adjustments seldom need be disturbed. The maintenance department is not often troubled with failures due to overloads and surges on the equipment. The supply department can function with precision and certainty. The office force gets into stride and the work goes on with a minimum of effort.

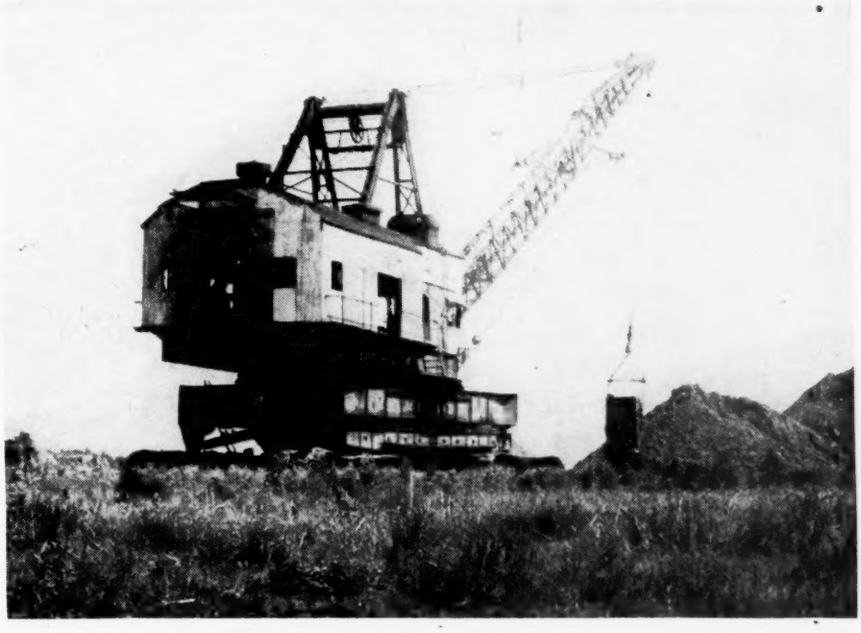
The land is slightly rolling; some of it almost level; none of it hilly. There are no high knolls or deep ravines. With these conditions it is not difficult to take care of surface drainage and dispose of pit water. In addition, heavy seepage from extensive spoil piles must be eliminated from the No. 3 pit.

The solution of the problem is based on ditching and pumping. Where the surface slopes toward the pit, ditches are dug at frequent intervals to interrupt the rainfall before it reaches the pit. These ditches are dug parallel to the cut by a small engine-driven dragline that moves under its own power to the location of the work. These ditches lead to a natural drain if that is available, but, when the terrain does not permit, the ditch leads to a reservoir from which the water is pumped over the rise to flow to some stream. Pit water is pumped over the highwall and into the system of ditches and reservoirs just described.

Seepage water from the old spoil piles of Pit No. 3 flows in a continuous stream into one end of that pit and into a sump, from which it is pumped over the highwall into the surface ditches. A permanent installation of four centrifugal pumps in the pit removes the seepage water and any storm water that may reach that point.

The surface reservoirs are dug with a 375-B dragline as stripping progresses and they are needed, but are kept within easy ditching distance of the highwall. They are of considerable depth and capacity. Usually there are two fairly large pumps to each reservoir—up to 125 hp. in size. A portable 2300/220/440-volt substation supplies power at each reservoir. These large pumps push the water over the rise through steel pipelines laid on the surface into a ditch dug to reach a natural stream. Portable pumps in the pit are fitted with hand-operated priming pumps.

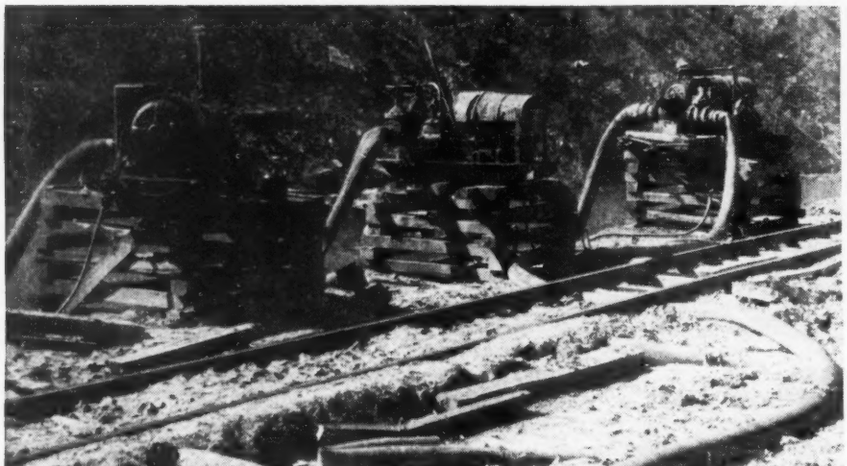
Pyramid has tough overburden. Some 43 percent is limestone. The management recognizes the necessity of breaking this rock small enough for the dipper to be pulled through the broken wall easily. Holes are staggered, 18 to 21 ft. apart in an equilateral triangle. This makes the rows 15 to 18 ft. apart.



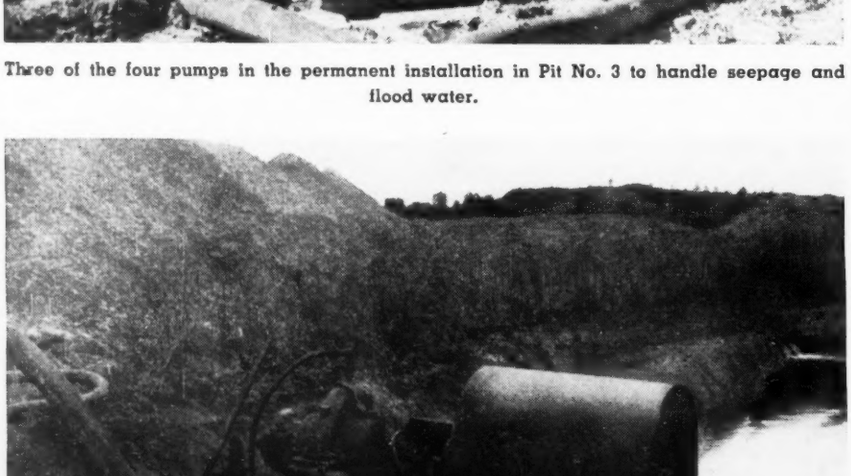
Utility dragline making a box cut for Pit No. 3.



Seepage from spoil piles continues through dry weather.



Three of the four pumps in the permanent installation in Pit No. 3 to handle seepage and flood water.



Surface reservoir and pumping installation to relay seepage and pit water over the hill to natural drain.

The actual distance is controlled by the nature of the overburden and the thickness of the limestone in the various sections of the pit.

Drilling is done with Sullivan vertical rotary drills with oil-well-type bits making 8-in. holes. Since there is not much weight in the tools, hydraulic pressure is used to force the drill down. These drills are mounted on Bucyrus-Erie crawlers and are entirely electrically driven by splashproof motors with weatherproof control.

Under normal conditions, holes are loaded with 17-lb. LOX cartridges that are exploded with electric caps fired with an electric blasting machine. Good results are reflected in the smallness of rock in the spoil pile. The cost is said to be lower than other types of explosives. Being one of the first mines in the field to use LOX, it has its own plant for making liquid oxygen.

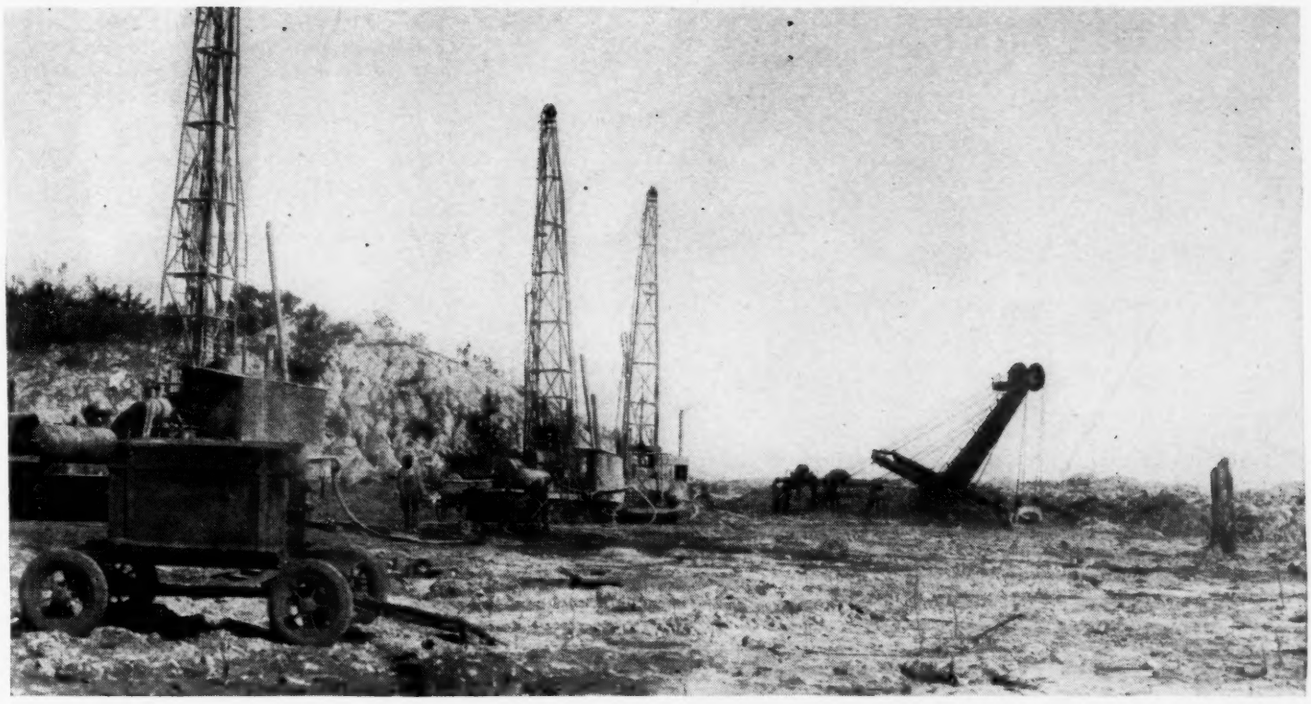
Sidewall drilling is used where conditions are favorable; that is, where the limestone thins out. A horizontal drill is kept in the pit for this work when it is needed. Some type of dynamite customarily is employed in these horizontal holes.

Two Shovels Employed

Two stripping shovels are used to uncover the 6-ft. seam at Pyramid, where the average overburden-coal ratio is eight to one. These are 18- and 30-cu. yd. Models 750-B and 950-B Bucyrus-Erie machines. For helping in deep overburden and for making box cuts and doing construction work, a 375-B dragline with 8- and 10-cu.yd. buckets is moved around as needed.

The 750-B stripper was a 12-cu.yd. machine when bought in 1928. After the purchase of the 950-B in 1936, the 750-B was converted into a counterbalanced 18-cu.yd. dipper shovel. With its 17 years of service, it still does efficient work. There is a spare 19-cu.yd. dipper that is used when the 18-cu.yd. unit needs rebuilding. The life of a dipper for either machine runs one to four years, depending on the character of the overburden it is required to handle.

The 950-B was put into service in December, 1936. It has a counterbalanced dipper, automatic leveling and individual motor drive on each of the crawlers. Although experience has modified some points of construction in later machines, this one has given a very good account of itself. Its average monthly score is 600,000 cu.yd.; that of the 750-B, 450,000 cu.yd. This is the required removal of overburden to produce 6,000 tons per day under a streamlined production schedule. It should surpass all past production records al-



Drilling highwall with rotary drills using oil-well-type drill bits. Hydraulic pressure forces bits down.

though there were peak days of more than 10,000 tons.

To make loading easy, the coal is cracked with from one to five sticks of powder, depending on the hardness. This facilitates the loading because the loading shovel is not required to break up the coal. Under normal conditions it is possible for the loaders to make four cycles a minute. There are two Bucyrus-Erie loaders with 5-cu.yd. dippers, one a 75-B and the other an 85-B. They load into 30-ton rubber-tired semi-trailers in each pit.

After years of experience with rail and truck haulage from the face to preparation plant, trucks have been adopted for gathering in both pits as now operated. Truck gathering relieves the pit of the cost of continuous shifting and maintenance of track in the pit and keeps it clear for the most efficient shovel operation. With its ability to climb grades of 15 percent or more, the truck has other advantages for gathering that rails do not have.

The fitness of trucks for gathering does not, of necessity, rule them out of the haul to the preparation plant. When the distance is favorable, the truck continues on to the point of coal delivery. The present mine setup employs truck haulage from Pit No. 1, a little more than a five-mile round trip.

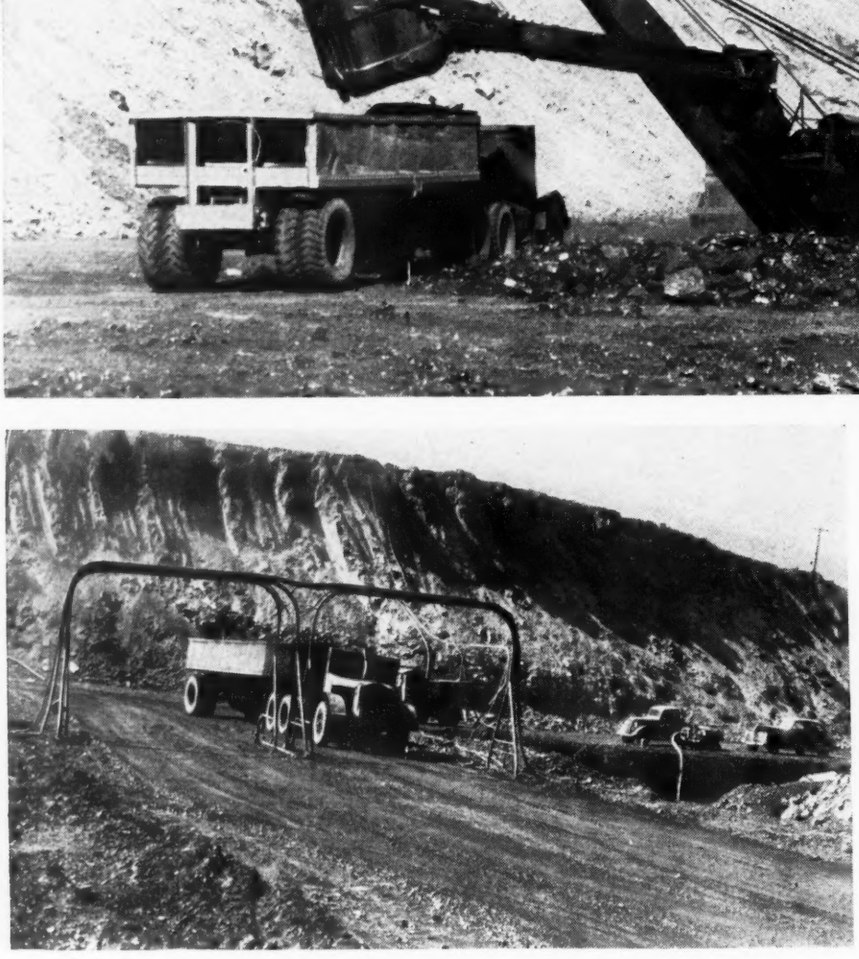
Several new 30-ton Euclid trucks have been added to the fleet serving Pit No. 1. These are equipped with two double-tired driving wheels, 150-hp. Cummins diesel engines and Euclid me-



This shovel, fitted with a counterbalance, now handles an 18-cu.yd. dipper.



Loading coal into a truck in Pit No. 1.



Truck passing under cable horses leaving Pit No. 1.



Train being loaded at transfer station for Pit No. 3.

chanically operated drop-bottom semi-trailers. There are five speeds forward; the first, 3.3 m.p.h., permits climbing a 24-percent grade; the fifth, 34.4 m.p.h., permits running on a 1-percent grade. These trucks average 17 round trips a day, carrying an average load of 27 tons of raw coal.

In the past, both standard and narrow-gage rail equipment has been used for combined gathering and haulage; also, standard-gage equipment has been used for haulage from a transfer station supplied by trucks. With this experience as a background, four gathering trucks now deliver coal from Pit No. 3 to a transfer station on the rim of the pit. The haul from that point to the preparation plant is with two small four-wheeled steam locomotives pulling 15-car trains of 10-ton contractors' side-dump cars over a 36-in.-gage track. The change to this system makes available considerable equipment for spares and for use at another mine.

Electric power is brought to the mine substation over a 33,000-volt three-phase delta-connected utility power line.

PERSONNEL

Hubert Howard .....president
E. F. Stevens.....vice-president
C. W. Woosley...gen. superintendent
Elmer Mayer .....asst. superintendent
Arthur Lee.....chief mining engineer
Joe Daffron.....chief electrician



Truck entering standard-gage rotary dump which will not be used as such until a new pit farther away is opened up and long rail haul established.

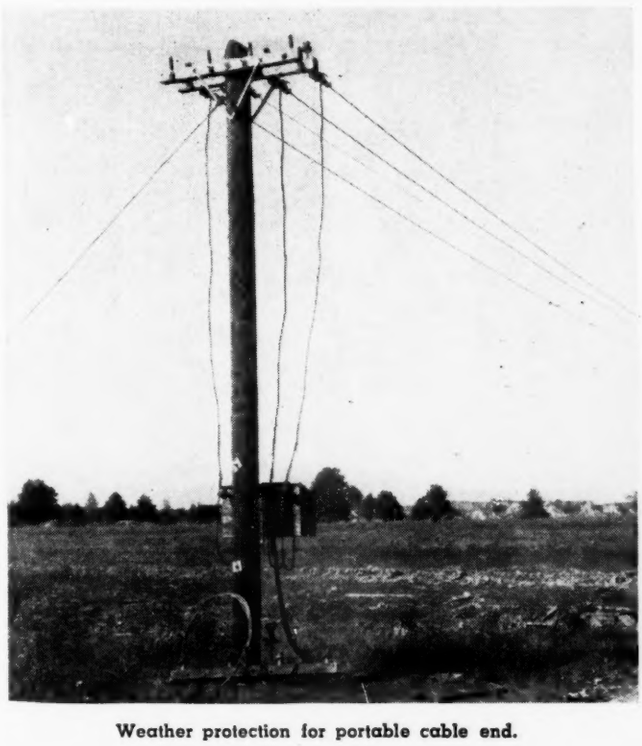
The secondary lines from this substation are 4,160-volt three-phase four-conductor grounded "Y," the accepted standard for power distribution for strip mines. Switching equipment with ground and overload protection is provided at the substation, all inclosed in a large portable steel switch house.

The several 4,160-volt power lines are bare copper carried on wooden poles to the various points of use. Permanent substations reduce this voltage to 440 at the washer and the LOX plant. Portable sled-mounted steel switch houses fitted with oil circuit brakers receive 4,160-volt power from pole lines, from which portable cables lead to the shovels and to portable sled-mounted substations that supply low-voltage current to drills and pumps.

Pole lines and cables are all four-conductor construction, the fourth wire being continuous from the 33,000-volt substation to the field connections If not the first, this was one of the first strip mines to install oil circuit breakers with provision for tripping on overloads and on grounding of a power conductor. Connections from pole line to cable and plugged connections between cable sections along the highwall are protected by carefully roofed wooden boxes to keep out rain and snow and so prevent moisture from reaching cable ends. These precautions are to minimize power interruptions.

The 15-year record of production at Pyramid, 1931 to 1945 inclusive, has been remarkably even. With many variables set up by weather, overburden, markets, strikes and breakdowns, the maximum year was but 16 percent above the average and the low year but 11 percent below that average—1,348,705 tons. The low year was 77 percent of the high year. In the same period of years, the State of Illinois had a low total production of but 44 percent of its high year.

Perhaps the most unusual thing at Pyramid is the lunch table at the operating office. It is here that the superintendent, his assistant and staff gather for lunch and to discuss the progress of the day and the operating problems that have arisen. These discussions, however, are not limited to long-faced or critical shop talk. An additional bit of human interest conversation maintains a fine temperature.



Weather protection for portable cable end.



Posted for all to view—the Pyramid production record:

1931	1,210,000	1939	1,192,293
1932	1,255,324	1940	1,386,445
1933	1,283,527	1941	1,453,525
1934	1,286,083	1942	1,464,895
1935	1,224,248	1943	1,347,377
1936	1,357,236	1944	1,419,939
1937	1,561,355	1945	1,390,786
1938	1,397,542	Total	20,230,575

AUTOMATIC CONTROLS

Essential for Conveyor Operation Today

Safety and Efficiency Promoted by Automatic Control of Conveyors at Bolair and Bergoo Mines — New Systems Facilitate Handling Supplies, Protection of Men and Equipment and Location of Trouble

By C. W. THOMPSON
Superintendent, Bolair Nos. 1 and 2 and Bergoo Nos. 2 and 6 Mines, Pardee & Curtin Lumber Co. Webster Springs, W. Va.

IMMEDIATE and effective steps had to be taken in the early part of 1943 at our Bolair No. 1 mine so that our system of controlling belt operation would keep pace with the rapid rate of development. Such a system had to incorporate remote, start, stop and reverse operation. Sequence starting of tandem units also had to be worked out. The layout, however, had to be simple but practical. Nor was this all. Because of tandem operation, protective features had to be developed so that men could be eliminated at transfer points.

This new mine in Webster County, West Virginia, is a drift operation in an area of Fire Creek coal 6 to 8 ft. thick. Rubber-tired shuttle cars deliver to belts that carry the coal to a 200-ton bin outside the drift mouth. The operation was described in the August, 1945, *Coal Age*. In the same vicinity, and also in the thick-coal area, another mine, Bolair No. 2, has been opened with belt transportation.

Pardee & Curtin's conveyors are not all in thick coal. In Bergoo No. 2 mine, where the company has had years of ex-

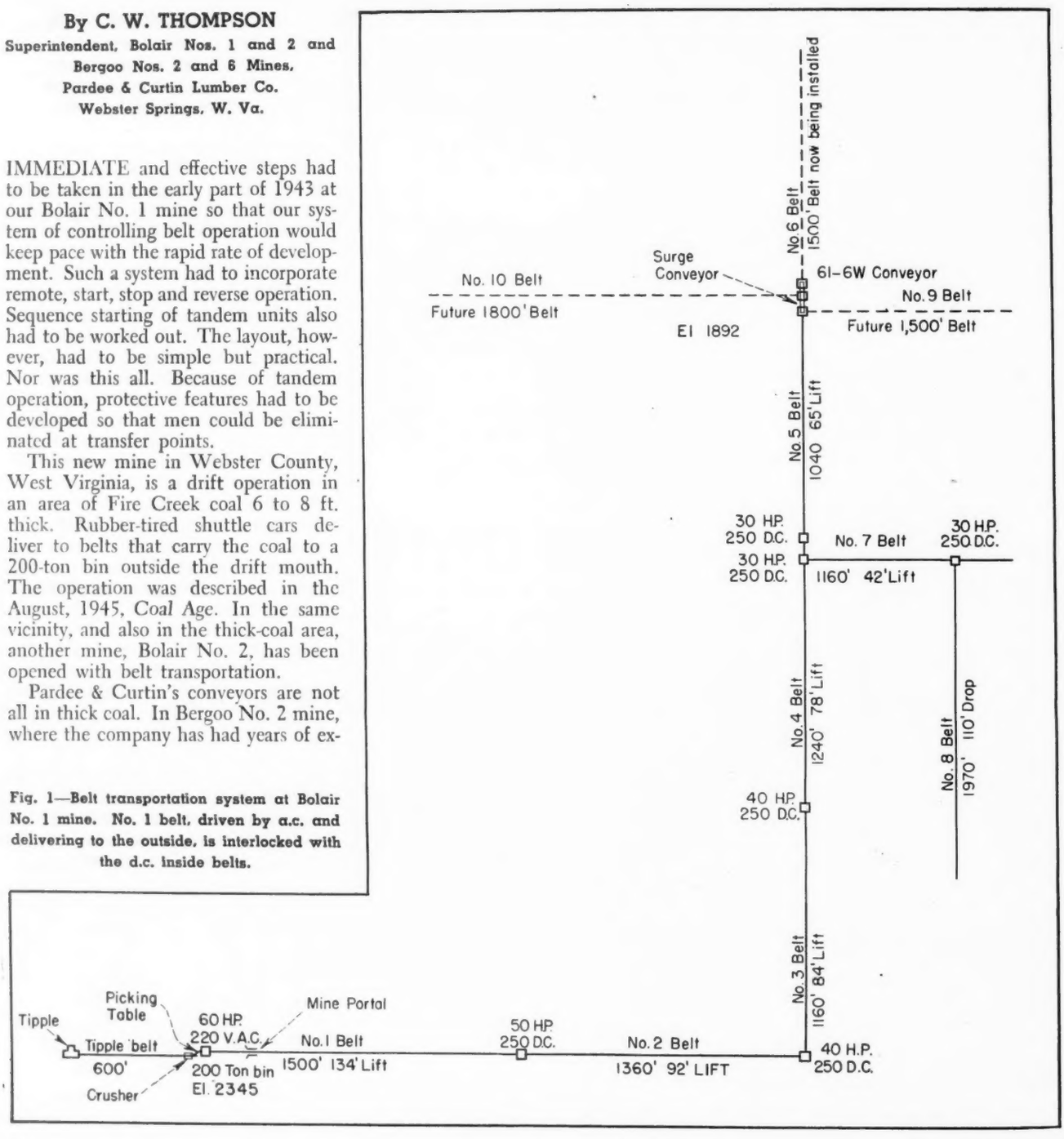


Fig. 1—Belt transportation system at Bolair No. 1 mine. No. 1 belt, driven by a.c. and delivering to the outside, is interlocked with the d.c. inside belts.

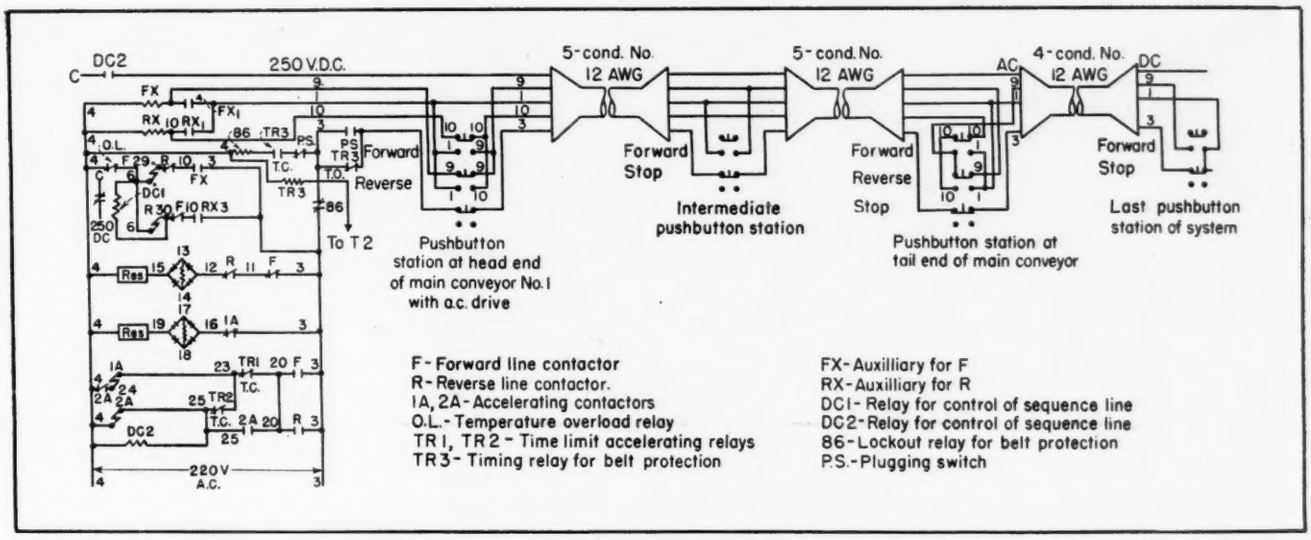


Fig. 2—Remote-control system for belt conveyors in Bolair No. 1 mine.

perience with chain conveyors and other mechanized mining, the coal ranges from 30 to 36 in. Section belts have been installed in this mine and there the low roof has called for the development of additional features in the automatic control system.

Smallest Number of Conductors

As indicated in Fig. 1, the No. 1, or portal, belt at Bolair is a.c.-driven while all inby belts are d.c. First and foremost among our problems was working out a method of control that would utilize the smallest possible number of conductors in the control circuit. The first obstacle confronting us was the mixture of a.c. and d.c. drives that had to be operated from the same control lines.

To accomplish that we decided to use a standard three-conductor a.c. push-button control with one extra conductor in the central cable to take care of reversing No. 1 belt. Another conductor, for direct current, was added to the cable, making a five-conductor cable for sequence control of the No. 2 belt inby of No. 1. It will be noted in the wiring diagram in Fig. 2 that this conductor is energized with direct current when "P. S." is closed, which at the same instant puts power on the top coil of the two-coil lockout device.

Then with the ideas finally piecing together, something fairly comprehensive began to appear. We knew we could have magnetic start, stop, reverse and sequence control by means of a five-conductor cable. This cable would extend only 1,500 ft. into the mine, inasmuch as we would be able to use four-conductor cable from the drive, or outby, end of No. 2 belt on into the mine. The four-conductor cable could be used because it was not necessary to have magnetic reversing of the No. 2 belt nor of the tandem units beyond that location.

Why Automatic Controls?

The necessity for an efficient control system can be readily seen by a study of Fig. 1. With automatic control we have been able to eliminate the need for men at the transfer points. This means that we are at present saving approximately 16 to 18 manshifts, calculated on two-shift operation, or a net of at least $180 per day. We found, however, that we had to work out a safe and dependable method to protect our belts whenever things occurred, such as slipping in drives, slate falls on the belt or failures of splices. This was achieved successfully and a detailed description appears later in this article.

The starting point of our belt transportation system at Bolair No. 1 mine is shown in Fig. 3. This is the head end of No. 1 belt conveyor, which is 1,500 ft. long between centers. The drive is a 60-hp. a.c. General Electric motor and the magnetic controller is Class P-9060300, made by the same company. The wiring diagram shown in Fig. 2 outlines the method of control and shows magnetic forward and reverse operation, together with sequence interlock and belt protection. The No. 2 belt, located just inby of First East off Main North, is operated by a 50-hp. d.c. drive and is controlled by the General Electric Class L-6926148 starting box shown in Fig. 4.

Controls for Handling Supplies

Coal-seam height at both Bolair No. 1 and No. 2 permits men to stand while handling ordinary mine supplies on the

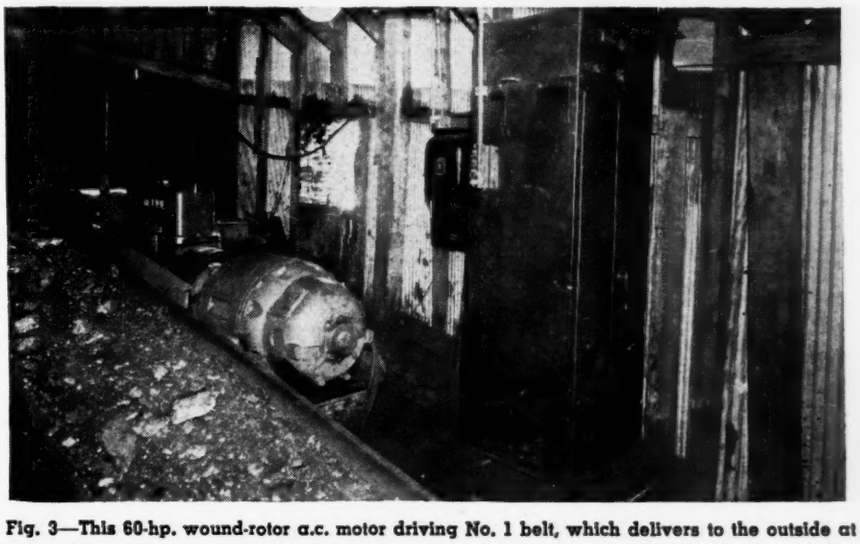


Fig. 3—This 60-hp. wound-rotor a.c. motor driving No. 1 belt, which delivers to the outside at Bolair No. 1 mine, is equipped with a start, stop and reversing control unit (cabinet at right).



Fig. 4—R. G. Shipman, inspector for Pardee & Curtin, pushes button that turns operation of the belt conveyors over to the automatic control system.

belt. However, in spite of this good height over the belts, we have installed supply tracks in both of those mines. Rails, ties, cross headers, props, conveyor materials, etc., are handled on supply trucks operated over these tracks and pulled by Jeffrey Type MH88 gathering locomotives.

In Bergoo No. 2 mine, however, which is in low coal, we found that to handle supplies efficiently on belts it was necessary to have magnetic reversing and dynamic braking, plus jog control. This arrangement permits the safe handling of supplies with a minimum of danger to the men on the job.

The wiring diagram set out in Fig. 5 shows the control system being used in 30- to 36-in. coal in the Eighth West section of Bergoo No. 2. Added features, such as being able to jog with dynamic braking and sequence interlock with magnetic forward and reverse operation, were attained while still holding the control cable to only five conductors.

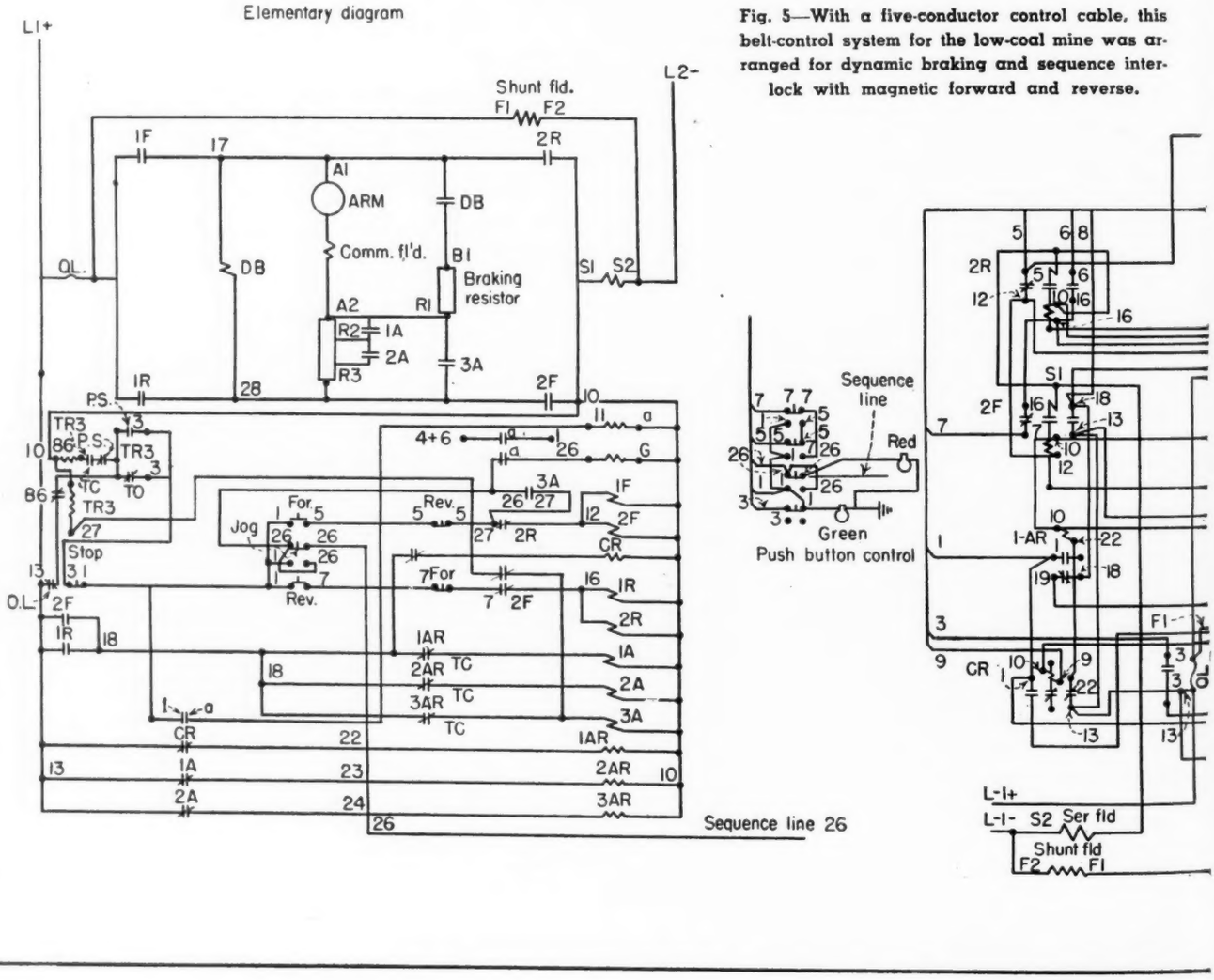


Fig. 5—With a five-conductor control cable, this belt-control system for the low-coal mine was arranged for dynamic braking and sequence interlock with magnetic forward and reverse.

Jog operation coupled with dynamic braking is very important in the safe handling of supplies on belts in our low coal. Fig. 6 is made from a photograph of the control unit that oversees operation of the butt-heading conveyor installation in Second Left, Eighth West. This station, adjacent to the belt drive, is just out of the picture to the right.

A demonstration of handling supplies safely and efficiently in Bergoo No. 2 is shown in Figs. 7 and 8, in which R. H. Beckwith, assistant superintendent, is operating the pushbutton station. On Second Left section, where a similar control system affords safe but speedy supplying of the working places, the materials are delivered on an off shift. With such an arrangement four men can operate in a team as follows: Two men can ride the belt ahead of the supplies. When they reach the back end they get off after the belt has been stopped by use of a conveniently placed pushbutton. The materials loaded on the conveyor

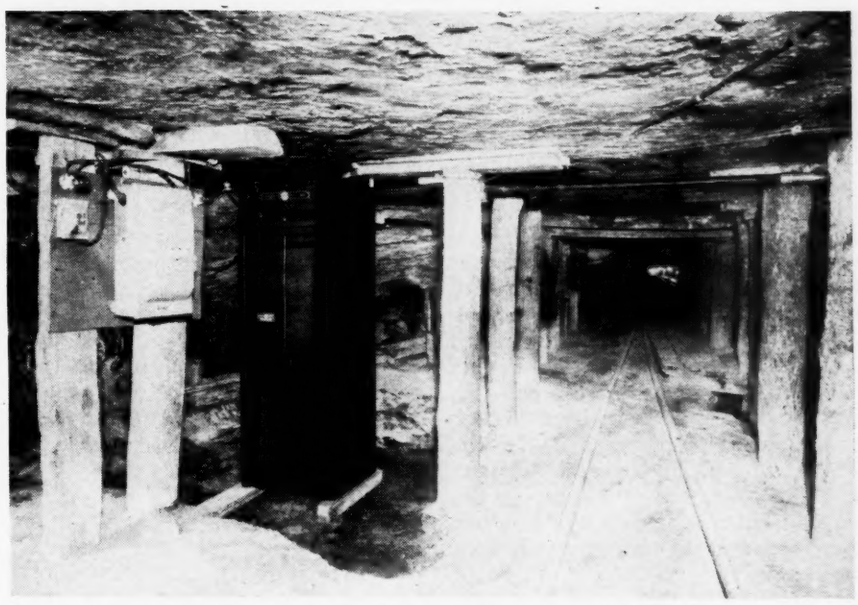
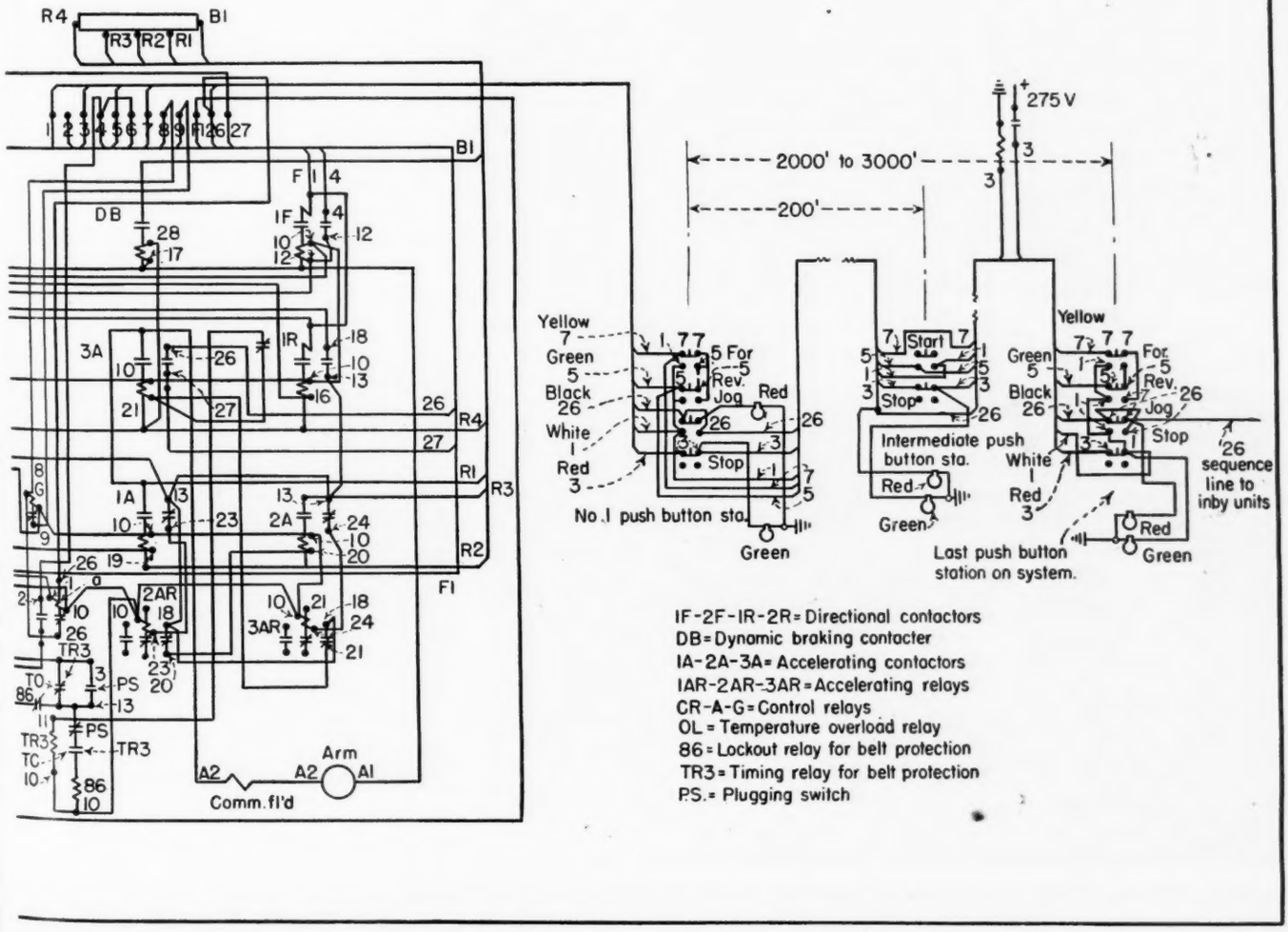


Fig. 6—This control cabinet houses the silent watchman overseeing complete operation of a butt-heading belt conveyor in the west part of Bergoo No. 2 mine.



at the outby loading station then are removed as they reach the end.

In unloading or transferring materials from one conveyor to another one man controls the movement of the belt and the other handles the material. The man at the pushbutton station must, when jogging, hold his finger on the button, as demonstrated by Mr. Beckwith in Fig. 7. When he is signaled by the man ahead that the belt has moved the desired distance, he releases the button and the belt stops almost instantly. After the desired quantity of supplies has been accumulated at the belt tail, the two men who have been loading at the mouth of the heading ride the belt in and assist in moving the supplies over the chain conveyor units to the working face. When all supplies have been delivered to the faces the four men of the crew get on the belt, put it into reverse (in this case the normal coal-carrying direction) and ride to the dumping point, from which they move on to First Left or to other sections.

Pushbutton Stations

It should be noted that each pushbutton station, regardless of location, such as along the belt or at either end, is equipped with a lockout arrangement whereby anyone can prevent the belt from starting if it is so desired. Momentary-contact pushbuttons were selected rather than the constant make-and-break type. The reason was to permit stopping a belt conveyor at any point and starting it or other belts at another location later on. Thus, a man inspecting the belt conveyor idlers or belt could stop the belt at any point and then walk in either direction and start it again without having to retrace his steps.

Belt Protection

We found out, by the hard way, that we would have to work out some method of protecting our belts from damage that would result from a number of occurrences. The hard way, for example, was when a take-up device broke, due to a fault in a steel chain, and released the tension on the No. 2 belt in Bolair No. 1 mine. That permitted the wrap drives to slip, thus causing the belt to stop. This resulted in a pile of coal between No. 2 and No. 3 belts and burned up the lagging on the two wrap drives. The belts also were burned at the drive locations. When all the figures were tabulated, we found that we had suffered a direct loss amounting to $750, which included a five-hour shutdown in production.

Belt Stoppage Guarded

The guard against belt stoppage is the General Electric plugging device shown in Fig. 9. This device, together with a time relay and a two-coil lockout device, gave us the protection we were after. This arrangement and method of fitting the idea into our control system is shown in the wiring diagram in Fig. 10. When the sequence line is energized, power passes through the normally closed contact of the lockout device, "C." At that instant the power over the sequence line energizes the starting coil of the belt-conveyor control unit and starts the TR3 relay to work. Contact "P.S." closes when the belt nears full speed and puts power on Coil "A." After this "T.C." is closed by "TR3," which energizes Coil "B." Then if "P.S." opens, due to some failure of the belt, Coil "A" is deenergized and forces "C" open to lock out. This shuts the belt down and will, of course, lock out all inby tandem units.

On all future units we will incorporate the protective arrangements out-

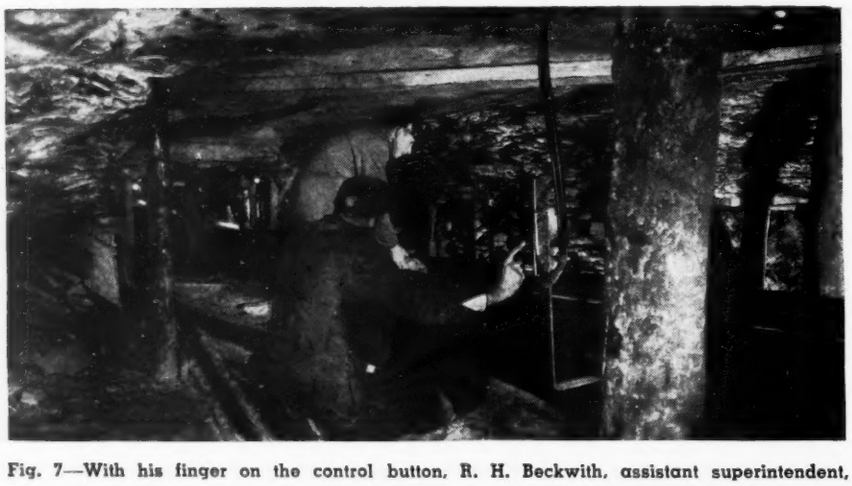


Fig. 7—With his finger on the control button, R. H. Beckwith, assistant superintendent, Bergoo No. 2 mine, demonstrates safety and efficiency in handling heavy timbers on the belt.



Fig. 8—Mr. Beckwith quickly stops the belt in Second Left, Bergoo No. 2, so the man inby him can remove a crossbar.

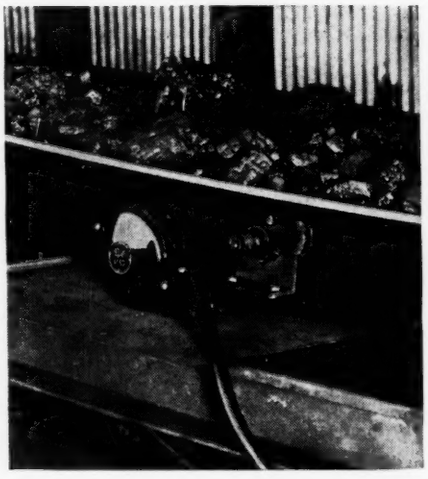


Fig. 9—This sentinel of protection—a plugging switch—will immediately cut power off the control system if the belt slows down or stops for any reason, such as a slate fall, splice failure or drive slippage.

lined in the wiring diagrams in Figs. 2 and 5. All future control units will be equipped with the above protective system incorporated into the unit itself.

Chain Conveyor Protection

In addition to belt protection, we have been able to work out a method of preventing our drag chains from running off or running out from under the pans of our room and mother conveyors. To make this possible a special intermediate pan was developed by the Jeffrey Mfg. Co. Fig. 11 illustrates the method of incorporating the chain-breakage protective device into the pan section.

When the plugging switch, time relay and lockout device are used in conjunction with the chain-breakage protective unit we are afforded foolproof protection. This means that should the chain come apart for any reason on the top or bottom of the conveyor line, the conveyor will instantly shut down, thus preventing the chain from running out and causing considerable damage if that conveyor was discharging to a belt. The system also eliminates tearing up the pan line to rethread the conveyor chains should they run out.

Trouble-Shooting Control Line

Again referring to the wiring diagram in Fig. 5, it will be noted that control-line trouble can be located easily with the small bulbs at the pushbutton stations. For instance, if a stop push-button corroded or was locked out by some prankster, the interruption could be

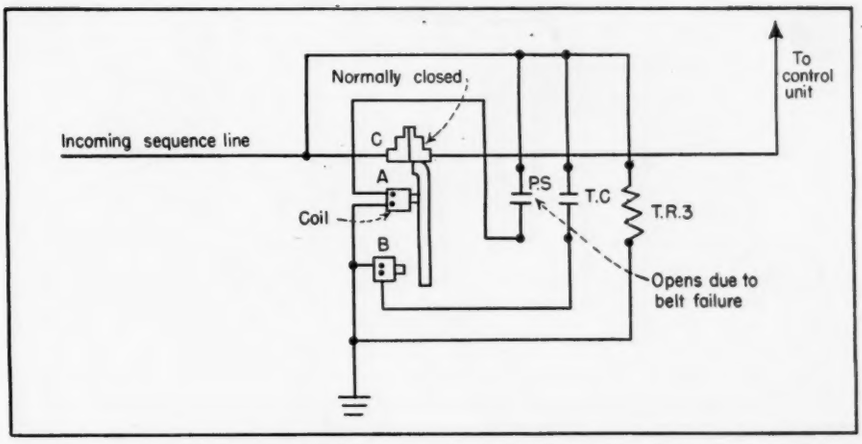


Fig. 10—Plugging switch with a time delay and two-coil lockout device protects belts against slow-down or stoppage.

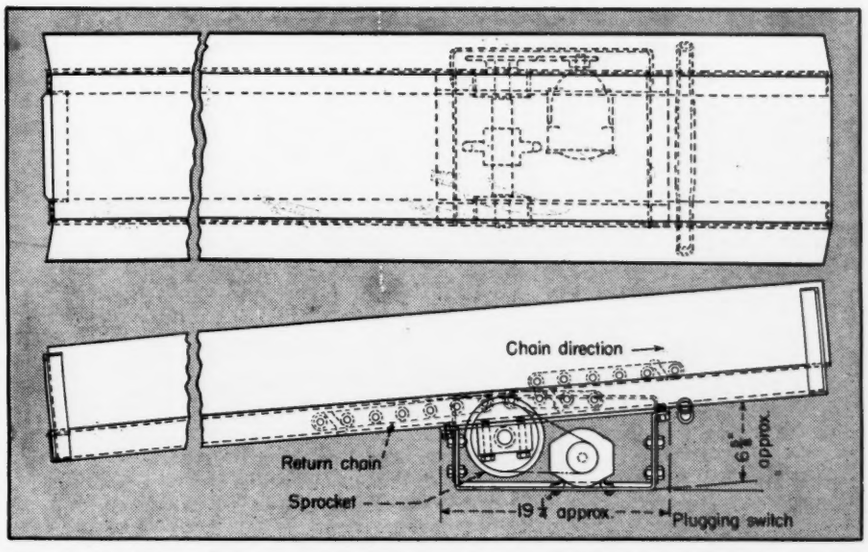


Fig. 11—An intermediate pan incorporating a plugging switch stops the chain conveyor drive if a chain breaks.

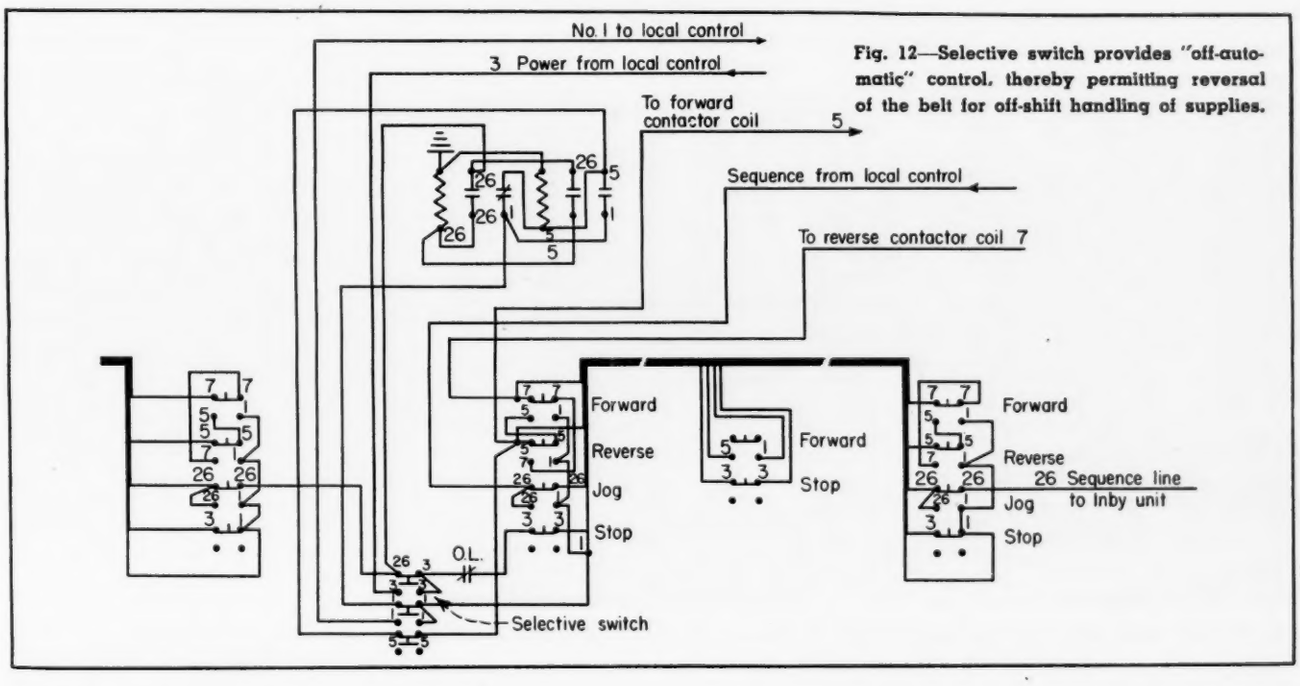


Fig. 12—Selective switch provides "off-automatic" control, thereby permitting reversal of the belt for off-shift handling of supplies.

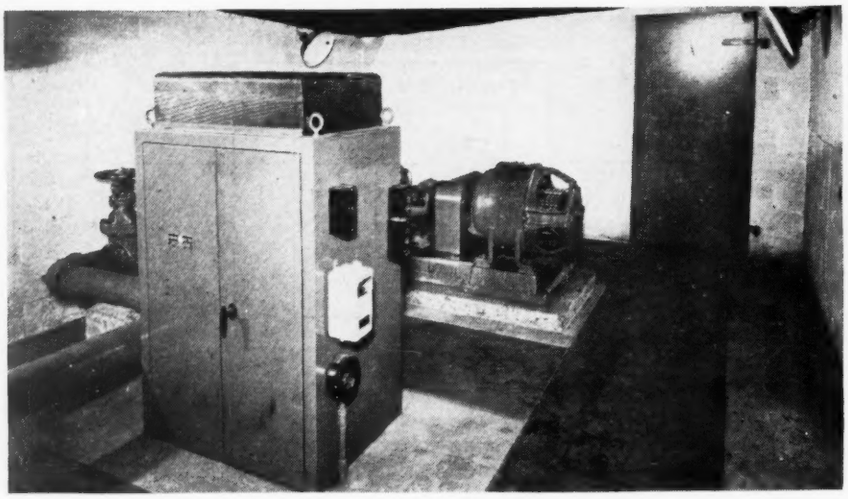


Fig. 13—This 500-g.p.m. mine pump is provided with automatic control, including off-peak overload protection, automatic start and stop and bypass arrangement that forces pump to start in a peak period if the sump is near overflow.



Fig. 14—Belt No. 4 discharging to No. 3 in Bolair No. 1. Sequence control prevents pile-ups at transfer points.

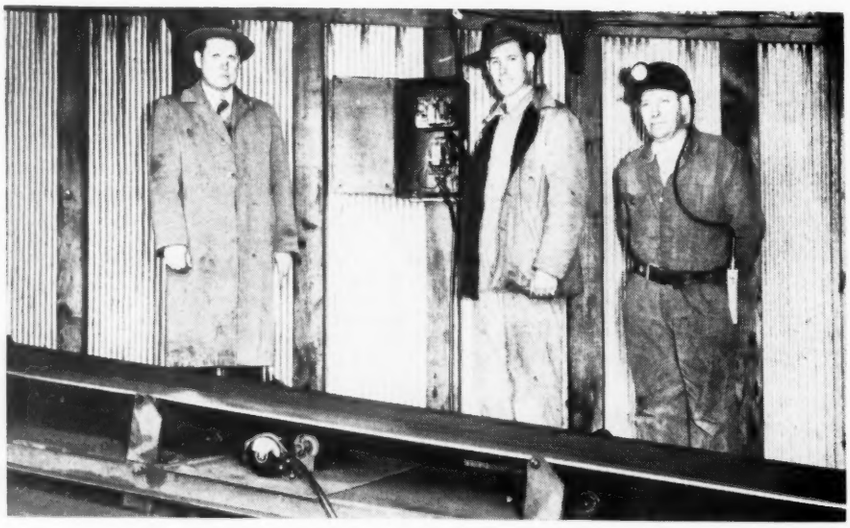


Fig. 15—The author (left), with Mr. Lively and R. G. Shipman, at the belt plugging switch and time relay and lockout device.

located by observing the bulbs at the pushbutton station. If the green bulb is burning, it shows trouble to be inby that point. If no light is observed, it means that the trouble is outby. To find the exact location of the interruption all that is necessary is to go inby, if the green light in on, to the last station where the light is out. Contrariwise, if the green bulb is out the man goes outby until he finds the station where the red bulb is burning.

Electric Eye Protection

By the use of a photo-electric eye we eliminate the possibility of a man riding through the head end of the main belt conveyor. When the light beam is interrupted the belt stops. Such control units should also be used at the inby ends of belt conveyors when they are used for riding men into the sections.

Specialized Control

Inspection of the belt transportation map for Bolair No. 1 mine (Fig. 1) shows that some method had to be worked out that would permit individual control of each separate unit, but at the same time would be automatic in so far as connection with the main-line belts and surge conveyor was concerned. That such a method was successfully developed can be seen in the wiring diagram in Fig. 12. When the main-line belts and surge conveyor are started each of the belts in the three directions from the surge conveyor will start. Each of the three, however, can be stopped irrespective of whether or not the main-line belts are running and can be started again if the outby main system is in operation.

A selective switch, as shown in Fig. 12, offers "off-automatic" control that permits reversing the belt for off-shift handling of supplies. Such a method prevents the entire transportation system from being stopped if either of the belts emptying into the surge conveyor is de-energized.

Industries of all kinds encounter thousands of situations in which exact control must be efficiently executed from remote locations. Why not the coal industry? Such applications as the automatic pump shown in Fig. 13 have made operation of the Pardee & Curtin mines safe and more efficient and will pay off. Of course, a certain practical limit must be set. However, with radar and electronics appearing on the industrial horizon, wider and more efficient applications in control will be open to all of us. Will we be ready to accept and keep pace with other industries? We certainly hope so.

CONVEYORS AND SCRAPERS

Raise Efficiency in Mammoth Mining

Conveyor With Special Tail Section Used in Clean-Up Work—Coal Slopes Driven Down the Pitch With Scraper and Chain-and-Flight Equipment—Tandem Gathering Conveyors Serve Units in Chambers

By ELKINS READ
Superintendent
Phoenix Coal Co.

And R. R. RICHART
Assistant Editor, Coal Age

CHAIN AND BELT conveyors are helping to expand production at a reopened property now known as the Phoenix colliery of the Phoenix Coal Co., Minersville, Schuylkill County, Pa. Prior to 1944, the property, originally the John Vieth colliery of the Philadelphia & Reading Coal & Iron Co., had been closed for 20 years. In the heart of the southern anthracite region, known for its steeply pitched and faulted seams, this property, by the use of conveyors plus track haulage, is producing 10 tons per crew man at the face.

The two existing shafts, one with five compartments and the other with four, and two 1,500-ft.-long rock tunnels at the 900-ft. level, shown in the accompanying illustration, have been important factors in the new underground development. However, the first problem was that of dewatering the mine, in which the water stood 600 ft. in the shafts. A used steel headframe was erected and a 900-hp. 2,300-volt geared hoist equipped with 2,000-gal. buckets installed to bail the water. The $1\frac{7}{8}$-in. rope could be wound on the 14-ft. cylindrical drums at 1,500 f.p.m. The hoist bailed 60,000,000 gal. of water in three months' time. Due to summer weather and constant hoisting, the rated capacity of the hoist motor was greatly exceeded. Blowers were used for cooling it.

After the mine was dewatered the existing tunnels were cleaned. The one leading N. 15 deg. 45 min. W. off the end of the five-compartment shaft is used as the return. Air is exhausted by a fan at the top of the shaft. The second tunnel, used as the haulway, leads east from the shaft, circles to the left, and runs parallel to the other tunnel on 250-ft. centers. Both water-level tunnels extend on a N. 15 deg. 45 min. W. course to the top of the North Delaware anticline, which lies on an almost east and west line 2,000 ft. north of the main shaft. Along this stretch, the tunnels cut through the Orchard, Prim-

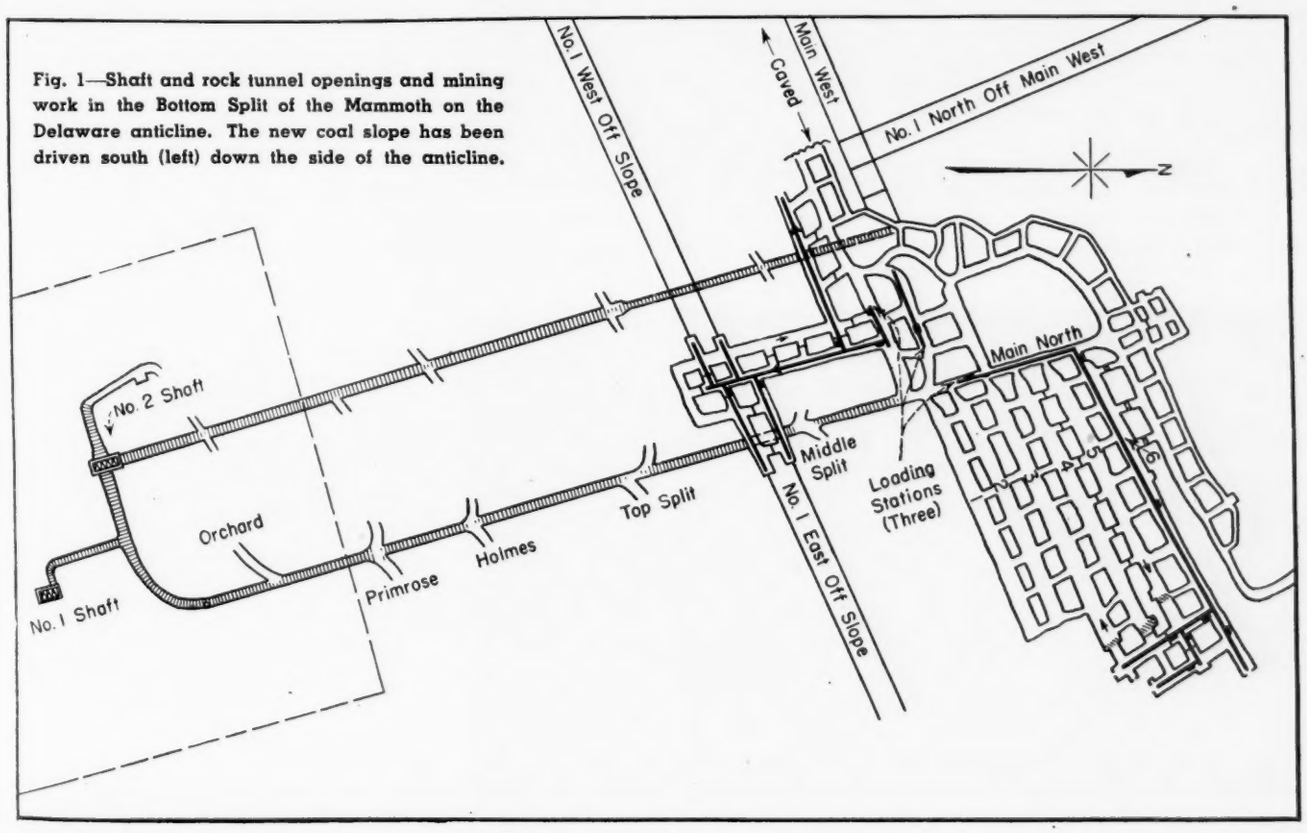
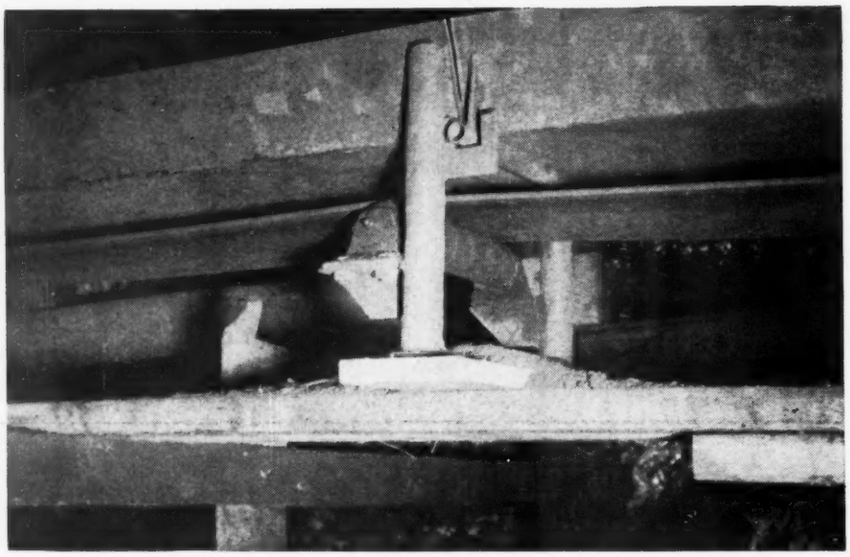
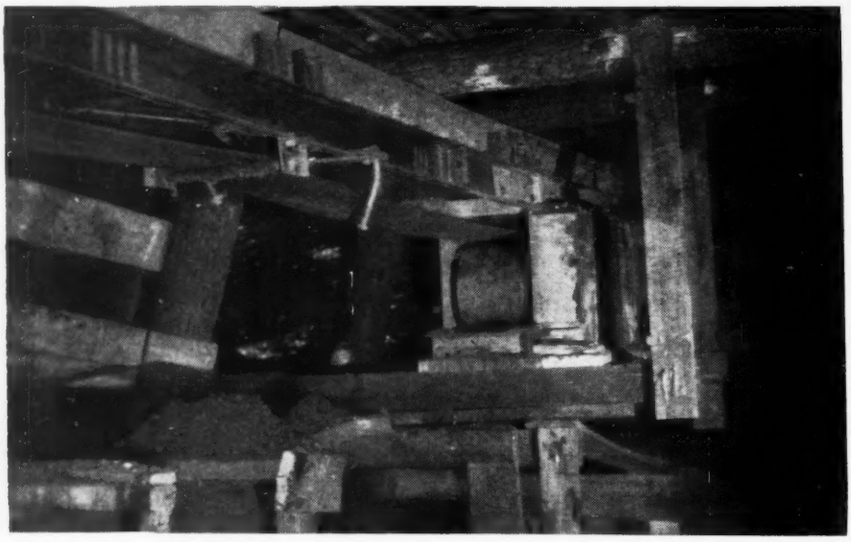


Fig. 1—Shaft and rock tunnel openings and mining work in the Bottom Split of the Mammoth on the Delaware anticline. The new coal slope has been driven south (left) down the side of the anticline.



The five-foot sections of the belt conveyor are held in place by a pipe and slot connection. The pipe support with return-roller brackets is integral with the pan at the left.



At the loading station each belt is raised to discharge into a chute above the car. This unit was used in clean-up work. Notice the 8-in. channels for carrying the sections that served as the tail conveyor.



The 12-in. belting was obtained in multiples of 10 ft.

rose, Holmes, and both the Top and Middle splits of the Mammoth, all pitching south on the south slope of the anticline. Both tunnels end in the Bottom split of the Mammoth, where the present underground work is concentrated.

The four-compartment shaft serves as an escape shaft and has its own 200-h.p. 440-volt hoist with a rope speed of 500 f.p.m.

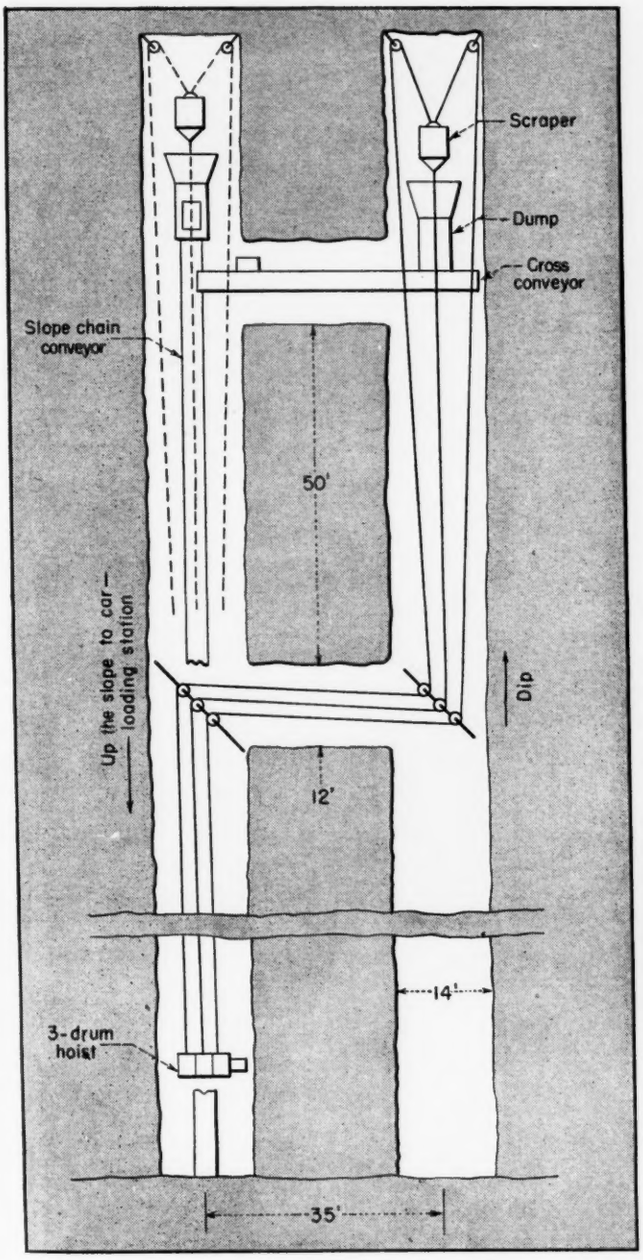
A belt conveyor built at the mine and comprising a 12-in. 4-ply belt sliding along the bottom of a troughed pan line was used in loading out the caved sections of the rock tunnels by hand. The drive was mounted on a mine car and four 5-ft. sections of pan troughing on two 8-in. channels suspended from the roof were carried behind it as a tail conveyor. This tail section was long enough to accommodate four cars. Ahead of the drive the belt line sloped gradually to the track level on a framework, thus facilitating shoveling material onto the belt. As the loading progressed the belt was extended in 5-ft. sections down the middle of the track. About every 200 ft. the entire unit was moved ahead and the tail section again suspended from the roof.

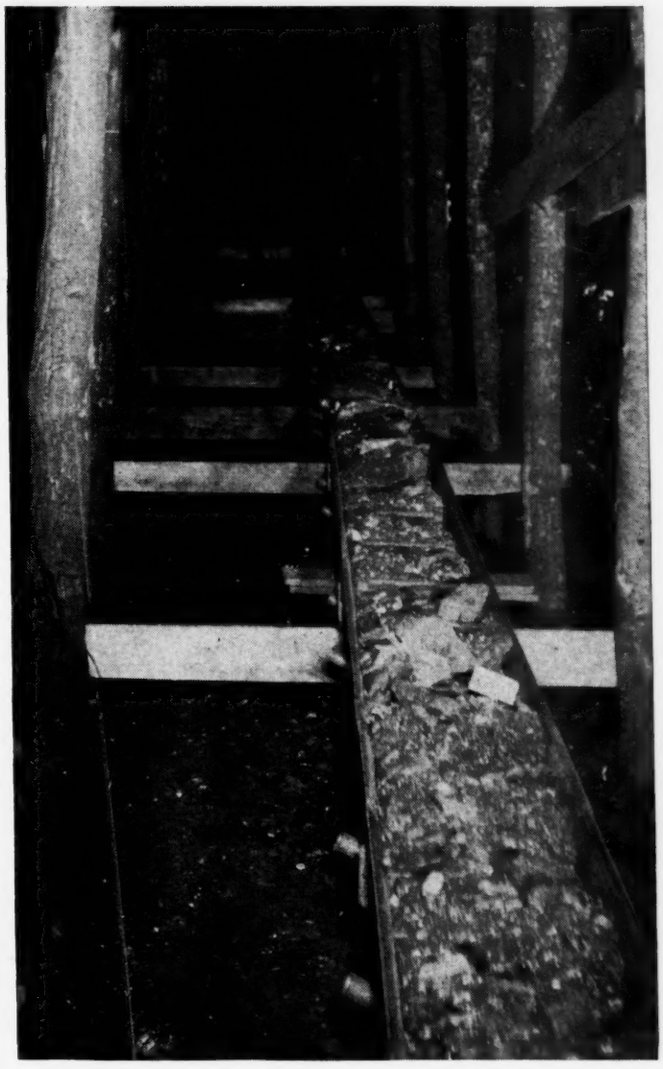
Belt Found Adaptable

Under the vein conditions at Phoenix, this type of belt conveyor has been found especially adaptable to efficient development. Changes in grade do not affect its operation, since the belt runs quite slack along the trough bottom. Fine pieces of anthracite rolling and sliding between the pan and the belt materially reduce the friction that would be expected in such an operation. The coefficient of friction for anthracite is 0.33 as against 0.50 for bituminous. Adopting a pin-and-slot fastener in place of bolts speeded the work of extending the line by 5-ft. sections. Belts are purchased in multiples of 10-ft. lengths and "Meco" hinge splices are used.

When a belt discharges direct to a loading station the practice is to elevate the belt gradually until the discharge end is high enough to get a chute between it and the top of the mine car. The flow of coal to the car is regulated by a steel chop gate. It is easy to get the headroom for a loading chute since the bottom split of the Mammoth along the ridge of the anticline is 16 to 18 ft. thick.

Since the 275-volt d.c. and 440-volt a.c. power circuits and all electrical equipment are kept on the intake air, 5-h.p. Ingersoll-Rand geared air motors (reversible) are used to drive some belts working in headings and breasts on the





This section of the slope chain is on a 15-deg. pitch. Part of the same 325-ft.-long conveyor is on 20- and 30-deg. pitches.

Fig. 2—How the sheaves were arranged for driving both slopes with one hoist.

return air. Other applications of the air-driven belts were in situations where breasts left gangways at too slight a grade but later steepened enough to permit the coal to slide down chutes. Short belts took care of moving the coal on out to the cross conveyors.

Semi-portable 220-c.f.m. 60-h.p. 440-volt motor-driven Chicago Pneumatic air compressors stationed near the working territory supply air at 100 lb. pressure for drilling and driving parts of the conveyor units and for maintaining a normal pressure of 30 lb. on the spraying system.

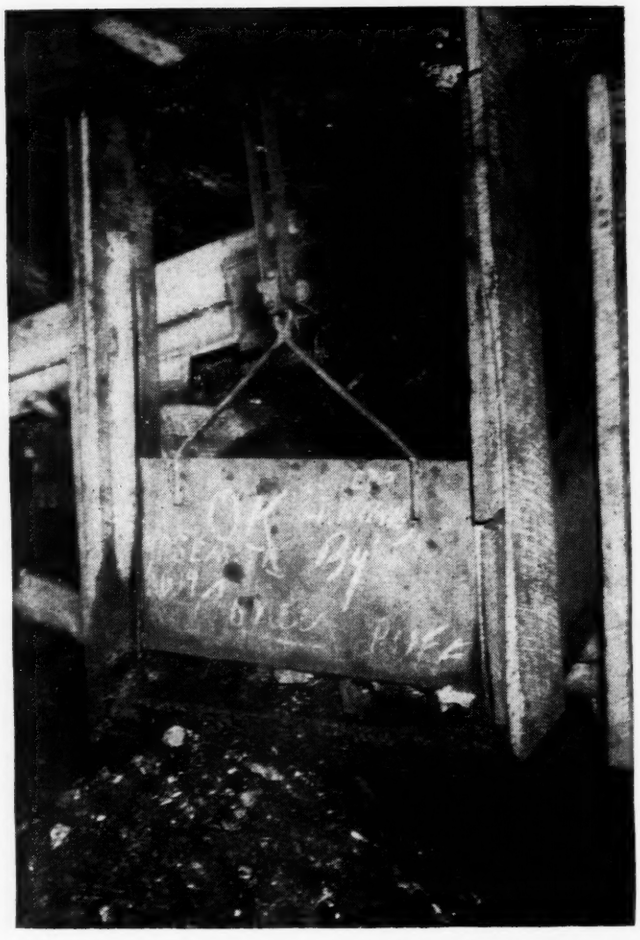
At present a six-chamber territory along the ridge of the anticline is being picked up by 125-f.p.m. La-Del chain conveyors equipped with 15-h.p. 440-volt drives. Where the floor of the territory is rather uneven each conveyor is carried level on wooden supports, anchored top and bottom. In this "flat" work some of the chains have been extended as much as 500 ft.

No. 6 Chamber in this territory serves as a conveyorway and is equipped with three chain units operating in tandem to work the face of No. 6 and also to receive the coal from a cross conveyor serving the other five chambers. The second chain discharges by dropping the coal directly onto the outby unit. However, when the third chain was installed it was set up to one side and discharges onto a tilted platform from which the coal slides into the next unit. This saves breakage and wear and tear on the conveyor bottom. This three-unit mother chain passes under the haulage track and discharges onto another chain that elevates the coal to a loading chute. In another territory, described later in this article, a heavier unit is dragging coal up a 325-ft. slope. The grades in this line are 30, 20 and 15 deg. as the discharge end is approached.

As the main haulage headings were advanced north the Bottom split turned down at 70 deg. on the north side of the anticline and work was stopped for the present. On the south slope of the anticline, however, vein conditions were more favorable. Here two 14-ft.-wide slope headings were driven on 35-ft. centers down the pitch, using "hoe-box" type scrapers and two chain conveyors.



Transferring the coal from one chain to another by a tilted platform eliminates breakage and conveyor trouble.



A chain conveyor discharging into a loading chute. The chop gate is closed while the trip is being eased ahead.

A scraper in each heading was operated from a single three-drum 30-h.p. I-R electric hoist. Each bottomless scraper measured 4x4x2 ft. high and had a curved blade in the back which projected down 3 in. below the sides. One $\frac{5}{8}$-in. pull rope and two $\frac{1}{2}$-in. tail ropes were used to manipulate the 1-cu.yd. scrapers. To serve the scraper in the back slope heading the three ropes were passed over two sets of sheaves and through the second crosscut from the face. The cross chain conveyor was always set up in the first crosscut. The main chain conveyor was kept on the center line of the slope heading in which the hoist was stationed, and passed directly beneath it.

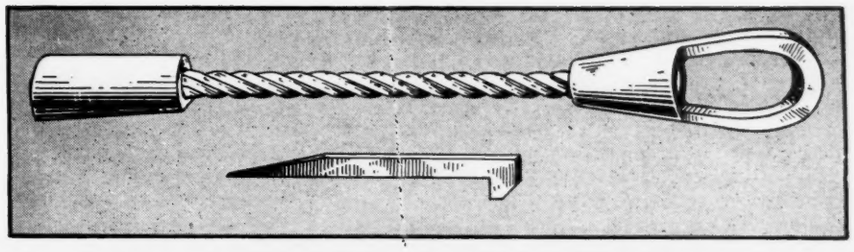


Two one-yard "Hoe-Box" type scrapers were used in driving the slope headings.

The 325-ft.-long slope headings followed the bottom split all the way. Thickness of the vein varied from 10 to 18 ft. with a low of 7 ft. over the second knuckle. For the first 100 ft. the grade was 15 deg. Then it changed to 20 deg. for the next 100 ft. and finally to 30 deg. for another 125 ft. At this point laterals run east and west, from which breasts will be driven back up the pitch. Coal from the breast chutes is to be conveyed across to the slope conveyor and up the slope to the car-loading station.

The driving of the slopes was double-shifted with six-man crews. Each crew loaded an 8-ft. fall from each place, or a total of 20 to 30 3½-ton cars for the shift. Use of a three-drum hoist and two tail sheaves, anchored in the roof at each corner of the face after the firing

Fig. 3—Flexible eyebolt and wedge allows sheave to adjust itself to the line of pull.



of the shots speeded loading and cleaning up. The two-tail-sheave method permitted closer spotting of the scraper and better cleaning of the fall. Use of two tail sheaves also permitted the hoist operator to keep the scraper traveling back and forth in the center of heading, away from the posts set along the sides.

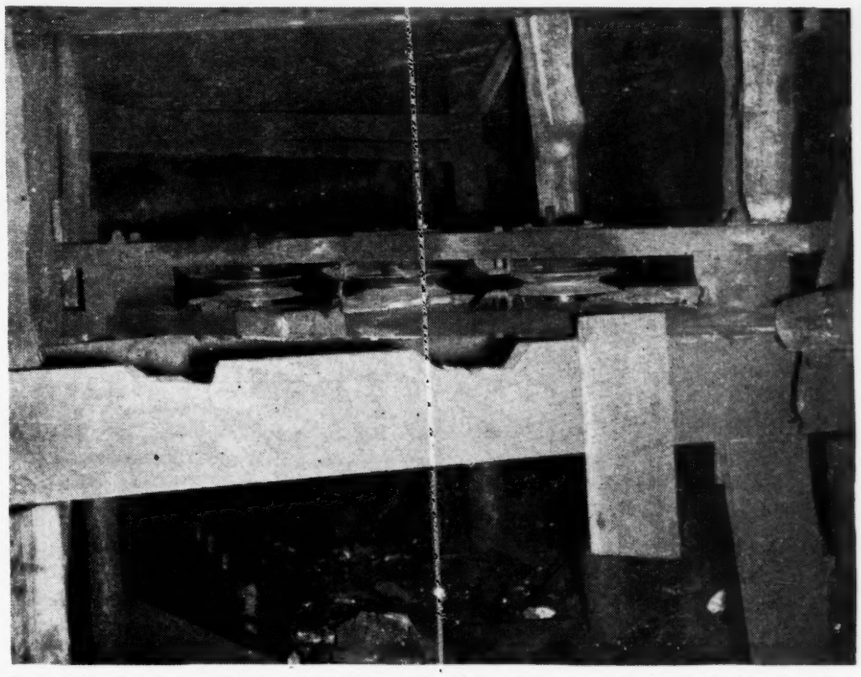
In anchoring the tail sheaves a flexible eyebolt, consisting of a standard closed socket attached by a ¾-in. wire rope 15 in. long to another socket fitted with an outside wedge, was used. This type of suspension enabled the sheave to adjust itself to the line of pull, thus reducing rope wear. All bending and shock stresses were taken up in the short length of rope and the chance of the wedge working loose and the eyebolt pulling out was lessened. This type of anchor is recoverable by hammering out the wedge.

Two racks carrying three sheaves each, illustrated elsewhere in this article, were used to get the three ropes to the scraper in the back heading. The sheaves over which the pull rope passed were made of manganese to prevent grooving and decrease rope wear. All sheaves had wide throats so that the socket on the end of the hope would pass when changes in set-up had to be made.

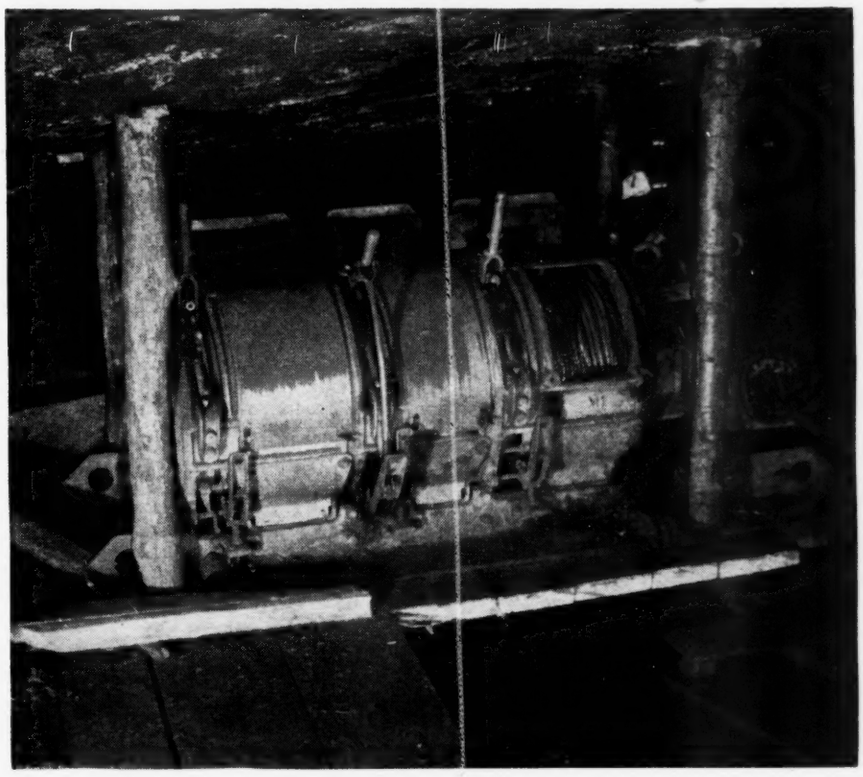
In the actual operation of the scraper the coal was pulled from the face and up the slope to an inclined ramp, where it was discharged to a chute feeding the chain conveyor. This distance was kept to a minimum. Both conveyors were extended so that the cross conveyor was always in the last crosscut.

Twelve 8-ft. holes usually were drilled to break down a face cut. In the top row five holes were started 3 ft. from the roof and angled up parallel to the rib. Then, three holes in the middle row were drilled straight in. Finally, four more holes were drilled straight in 6 in. up from the sandstone bottom. Six sticks of 1¼x8-in. Austin Red Diamond No. 2 permissible powder were charged per hole in the top and bottom rows, with five sticks per hole in the middle row. Two of the top holes were shot with exploders and the rest with Austin 1 to 5 delay electric caps.

All mining at the face is done under contract. Ten men assigned to two 24-ft.-wide breasts load 30 3½-ton cars per shift. All falls are sprayed with



Part of the sheaves used when the hoist was handling the scraper in the back slope heading. Note the chain line below.



With this three-drum hoist a six-man crew loaded a fall in each slope in a shift.

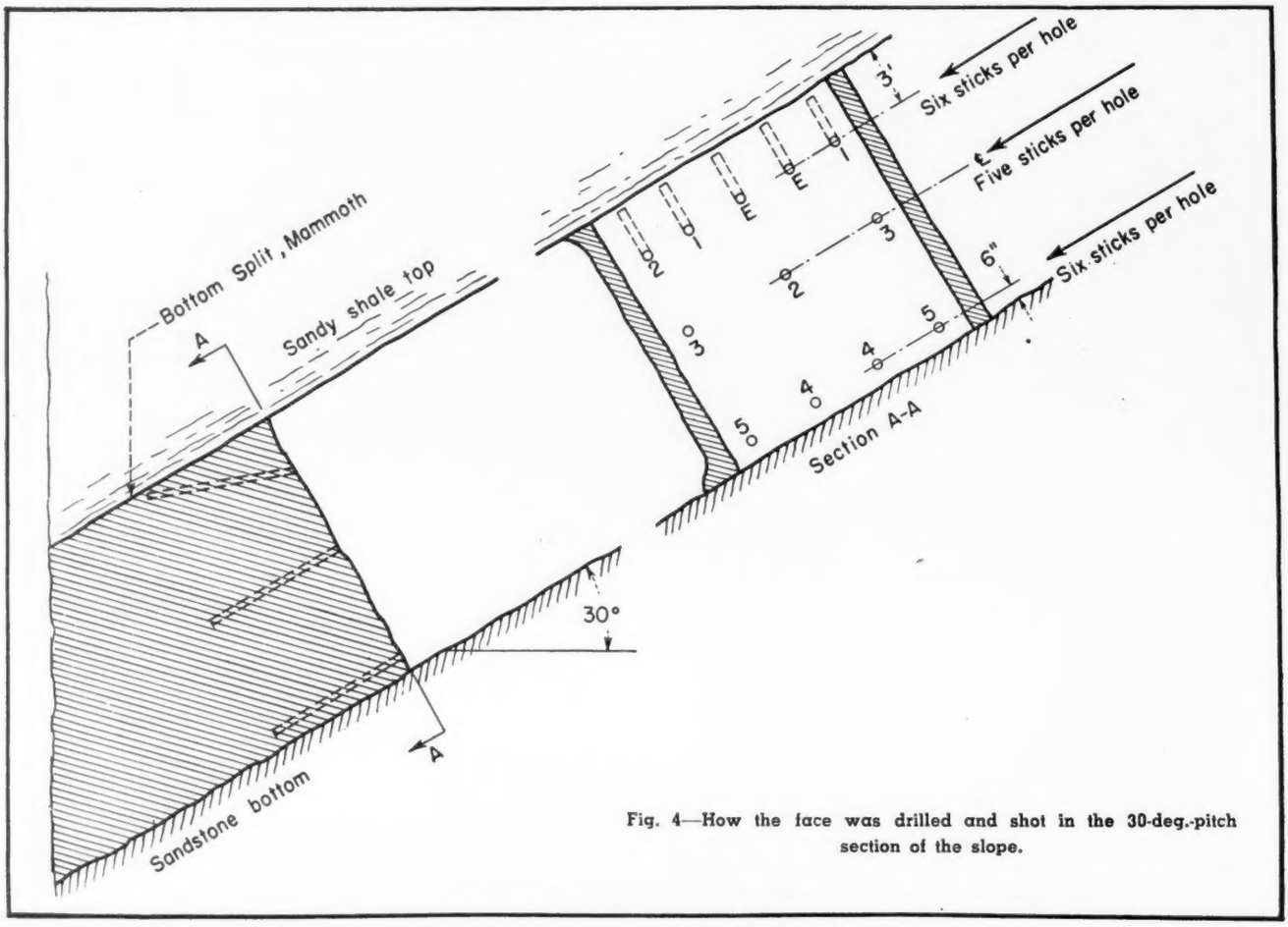
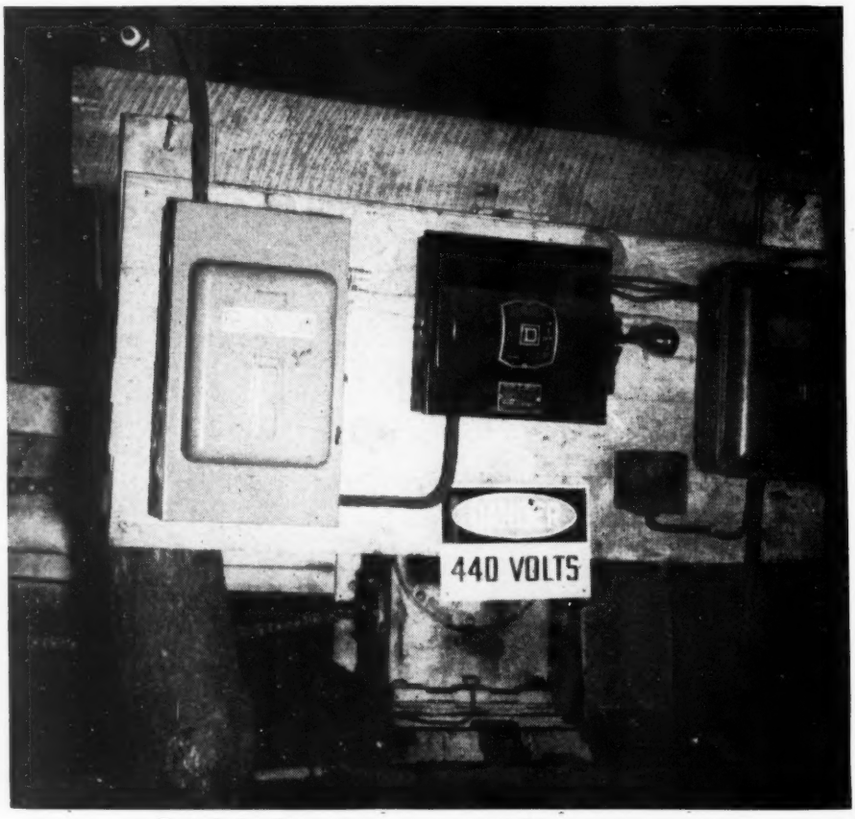


Fig. 4—How the face was drilled and shot in the 30-deg.-pitch section of the slope.



Controls for the conveyors are operated by company men.

water at 30-lb. pressure before the coal is shoveled onto belts, chains or, if the pitch permits, into down chutes. Timbers and parts for extending the conveyor lines are carried from the head of the last conveyor to the face by the contract miners. The controls for all conveyors, loading stations, car hoists and main-line haulage units are handled by company men on shift pay.

Installation of a No. 13½ single-inlet Buffalo Forge fan with a 75-h.p. motor and V-belt drive was about complete when this article was prepared. The new fan will furnish the mine with four times the volume of air supplied by the old unit.

At present, 500 tons of deep-mined coal and 500 tons of strip coal, delivered by trucks, is cleaned daily in the washing plant. Four Wilmot Type D jigs prepare the stove, nut and pea grades. Six Deister Plat-O coal-washing tables prepare the buck, rice and barley grades.

Operating and supervisory officials are: William S. Jermyn, president; Major Lee White Jr., secretary and treasurer; Paul Sieber, purchasing agent; Elkins Read, superintendent; Lyle Devers, mine foreman; Frank Kaczenski, top foreman; Fred Shylan, master mechanic; and Stanley Strange, electrician.



Hamilton washer, showing crushed-coal conveyor, washer building and washed-coal bins.

MODERN WASHERIES

Culminate T.C.I. Preparation Evolution

Starting Operations in the Birmingham District in 1886, T.C.I. Installed First Washer in 1892—Five Plants Now in Operation Include Modern Jig Washers and Auxiliary Units for Coking-Coal Preparation

By W. S. SPRINGER
Superintendent, Coal Washers, Mines

and WALLACE J. McROY
Operations Engineer, Washers
Tennessee Coal, Iron & R.R. Co.
United States Steel Corp. Subsidiary
Birmingham, Ala.

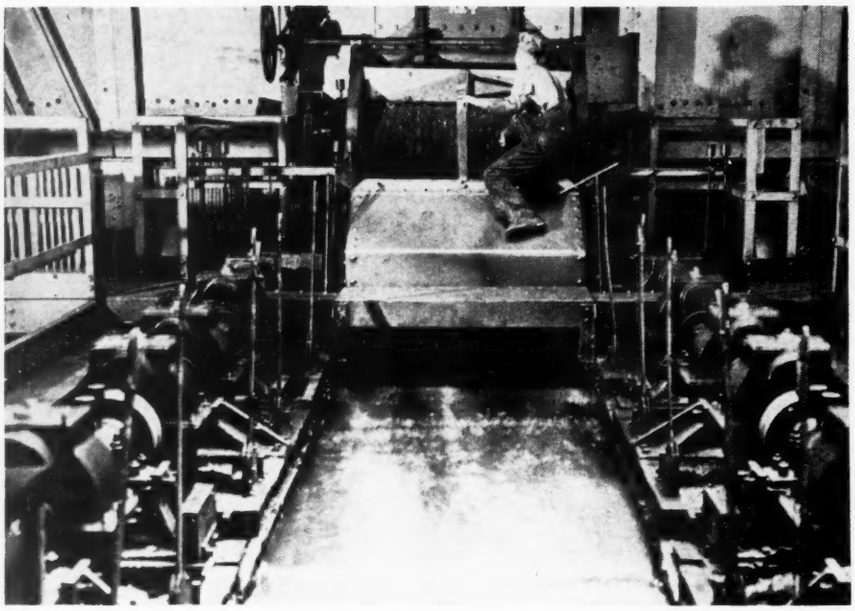
THE Tennessee Coal, Iron & R.R Co., founded in the hills of Tennessee, went to the Birmingham district in 1886 when it absorbed the Pratt Coal & Iron Co., a consolidation of the Pratt Coal & Coke Co., the Alice Furnace Co., and the Linn Iron Works. In 1889, just two years after the advent of the Tennessee Coal, Iron & R.R Co. and only ten years after the first slope had been opened, 1,108,300 tons of coal was produced by eight mines then in operation. In that same year, the company had 806 coke ovens that produced 267,514 tons of coke.

In the first years of operation mine-run coal was charged into the ovens and coked. Later, the operators installed a shaking-screen run by a steam engine. It sized the mine-run coal at 1½ in. The large material from the screen was loaded into railroad cars to be used at the plants as boiler coal. The slack coal was sent to the coke ovens.

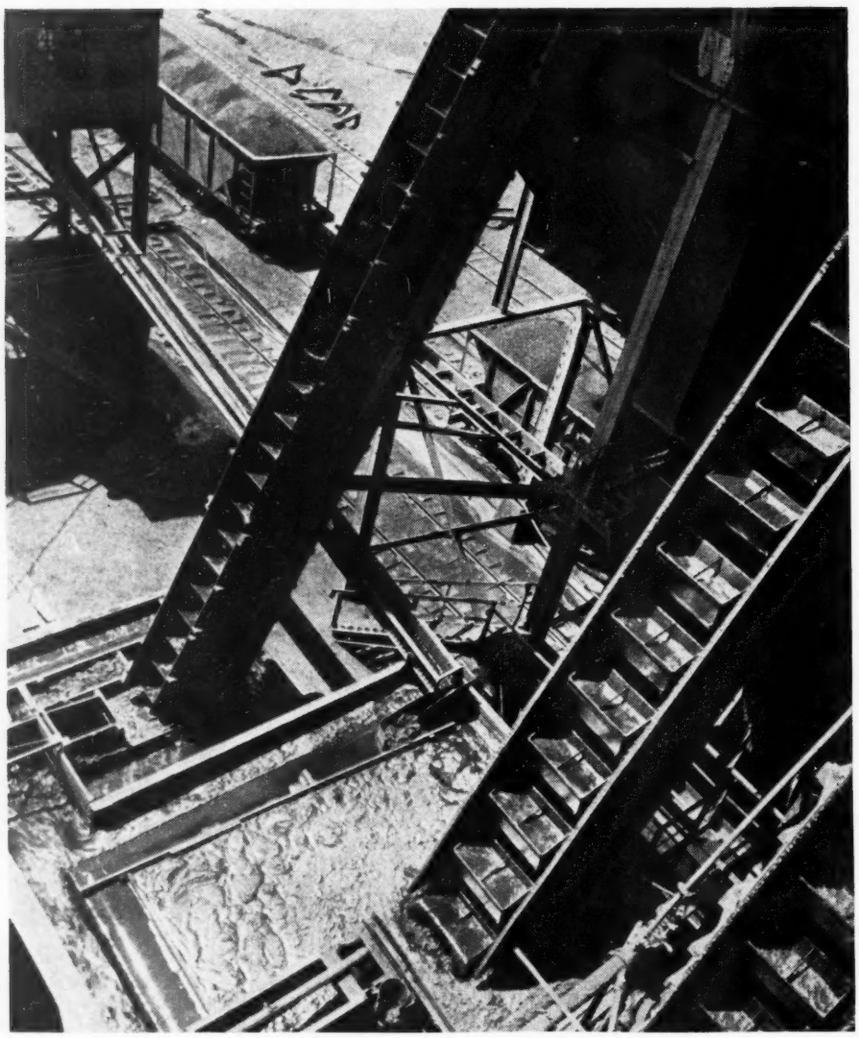
Quality of the coal did not compare favorably with that of other coking coals of the country: i.e., it contained too many impurities of a size uneconomical for hand picking. In 1892, therefore, the first washing plant in America was erected at No. 1 slope. This plant (Fig. 1) involved a screening operation, a washing operation, a refuse-disposal problem and a circulating system. Power was supplied by a steam engine. Coal was fed from the tipple bin to a shaking screen making a separation at 1½ in. The plus 1½-in. coal was loaded into railroad cars and shipped as lump. The slack was carried by screw conveyor and bucket elevator to a Robinson washer.

This washer was an upward-current classifier into which the feed was dropped from the raw-coal elevator. Washed coal overflowed the sides of the washing tank (conical in shape) and refuse was withdrawn through a set of doors at the bottom. Water was admitted under pressure through a perforated ring near the bottom of the cone. The feed was agitated by a number of rotating iron arms within the tank. The washed coal was carried by bucket elevator to a washed-coal bin from which it could be loaded out and sent to the coke ovens. The refuse from the washer was hauled off in a mule-powered dump cart.

The buckets in the washed-coal elevator were perforated for dewatering purposes. Water from the elevator buckets, plus all other water that escaped from the tank, was discharged to the creek until a Ramsey sludge tank was added to the system. This tank also was conical in shape. Water entered at the top and was forced around a



Jig washing in the Hamilton plant. Jigs of this type handle 100 tons of coal per hour and use water at a rate of 2,000 g.p.m.



Wash-coal pits and elevators at Hamilton. The dewatering elevators deliver to storage bins, from which the coal is loaded into railroad cars.

horizontal baffle plate. It was withdrawn through a pipe just under the baffle plate. Solids were withdrawn from the bottom of the tank. The impelling motion in the circulating system was furnished by a steam jet.

Similar Plants Added

Similar plants were erected at No. 2 slope and at the oven plant at Pratt City. The installation at Pratt City was known as the Big Oven washer.

Jigs and crushers were introduced into the washing operation in 1909-10, when the Big Oven washer was dismantled and rebuilt and Pratt Nos. 3, 4 and 5 washers were constructed and put into operation. These new plants, the most up-to-date washeries in the country at that time, had a combined jigging capacity of 760 tons per hour. These plants were similar in design and operation with the exception that the Big Oven washer had a larger capacity than the others. It was a seven-jig plant while the others were built with four.

Big Oven Operation

The Big Oven plant (Fig. 2) had two foreign-coal unloading bins feeding to two shaking screens in parallel. These shakers separated the coal at 1¼ in. The oversized material was then crushed to minus 1¼ in. and sent with the slack from the shakers via a bucket elevator to the washer raw-coal bins. The coal went from these bins to seven Stewart jigs arranged in parallel.

These jigs were one-compartment one-cell basket-type affairs. The washing box, which had a perforated bottom, was alternately raised and lowered in a tank of water (36 2½-in. strokes per minute). The raw product entered at one end of the box, was stratified by the jigging action and was removed at the other end. The washed coal overflowed the discharge end and the refuse was ejected through a valve at the bottom of the box. The opening of this valve was controlled manually—the amount of opening depending on the depth of the rock bed.

The washed coal was flumed to two sumps, from which it was transferred by dewatering bucket elevators to the washed-coal bin. An electric larry distributed the coal in this bin, which had a capacity of 1,000 tons. Two dinkeys carried the coal from the bin to the coke ovens. Refuse was moved by flume, elevator and drag to the refuse bin, from which it was hauled away by a steam dinkey.

By 1913, the company had ten preparation plants in operation and in that year produced 2,216,000 tons of washed

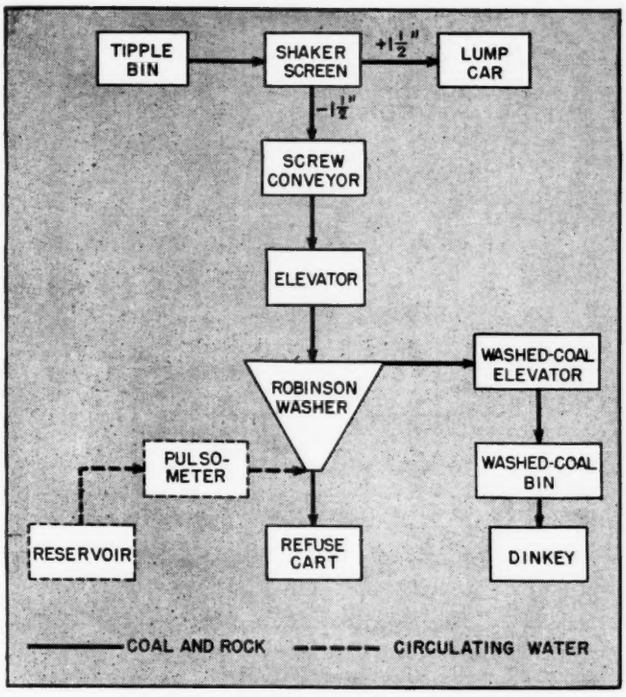


Fig. 1—Flow diagram, Pratt No. 1 washer.

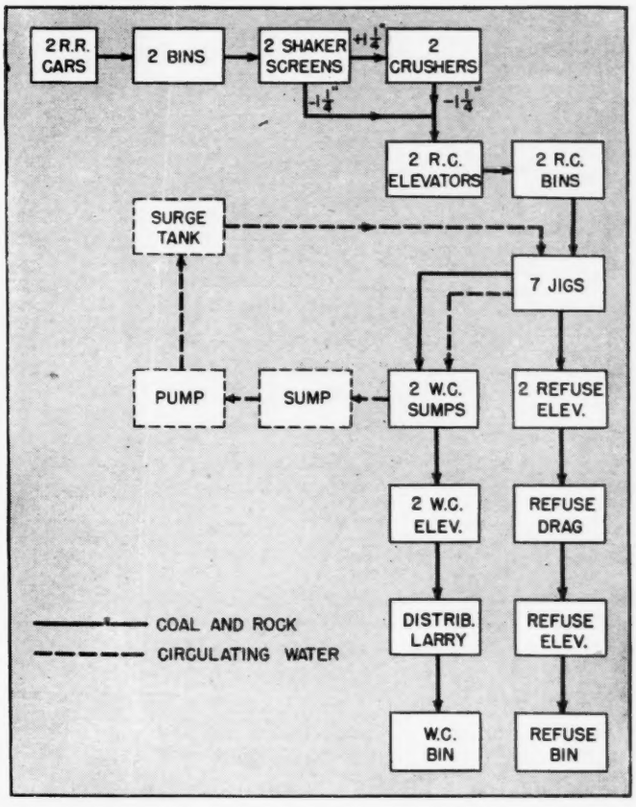


Fig. 2—Flow diagram, Big Oven washer.

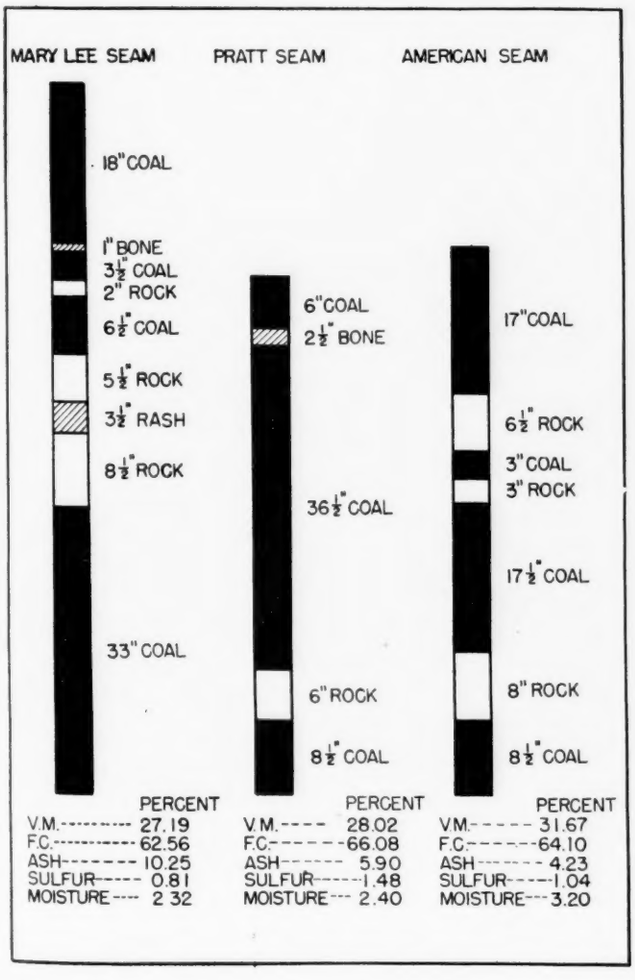
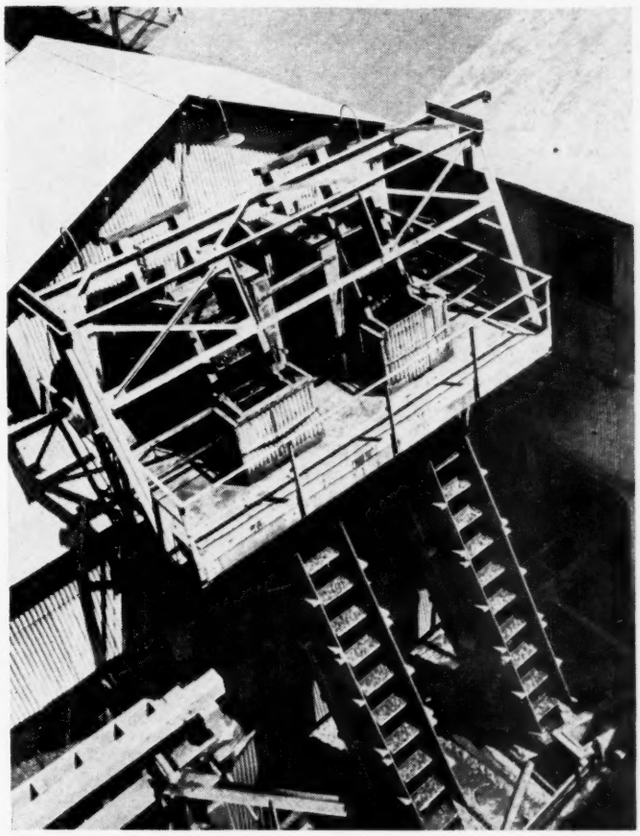


Fig. 3—Seams and analyses of coal washed.



Refuse pits and elevators at Hamilton washery. The dewatering elevators deliver to a refuse bin, from which refuse is transported to the bank by trucks.

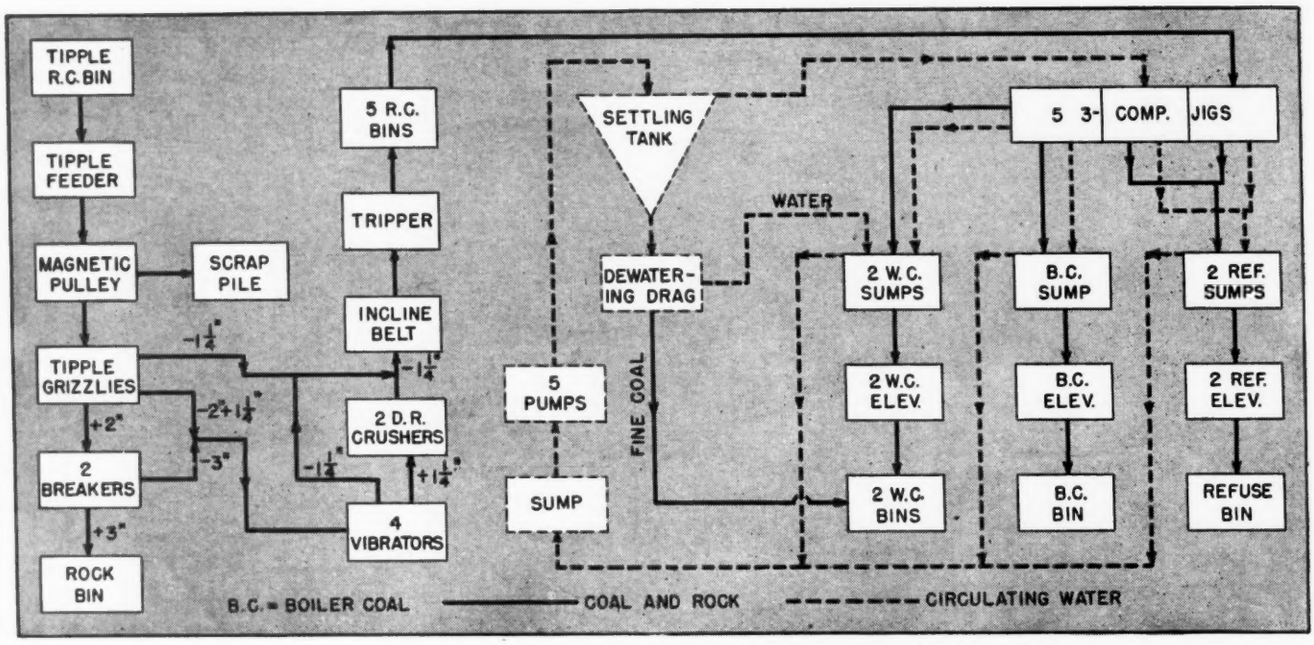


Fig. 4—Flow diagram, Hamilton washer.

coal. Two of these plants were still using the Robinson-Ramsey washer, seven plants, Stewart jigs; and one plant (Blossburg E), a three-cell jig of the Foust type with a capacity of 40 tons per hour.

In 1914 a new coal washer with a capacity of 110 tons per hour was erected and put in operation at Pratt No. 8. Foreign-coal unloading pits and elevators were put in operation at Pratt Nos. 3, 5 and 8 washers, thereby permitting the abandonment of the old central washer at Big Oven. During this year, also, dams were built to make settling ponds at No. 3 and No. 5 washers. In the following twelve months, 2,344 tons of fine coal (recovered by hand and utilized as boiler coal) was reclaimed from the ponds at No. 3 and 3,175 tons was reclaimed from the No. 5.

Details of Pratt No. 8

The plant built at Pratt No. 8 had two three-compartment Elmore jigs each with a capacity of 55 tons per hour. In addition, it had two electrically driven centrifugal dryers for drying the washed coal and a sludge recovery tank for fine coal. After a year of operation the records contain this entry:

"The results obtained at this washer (Pratt No. 8) during the year are most satisfactory and prove the three-cell type of jig the most efficient for washing Pratt coal.

"Pratt No. 4 washer gave the best results with the Stewart jigs during the year. A comparative statement for No. 4 and 8 washers follows:

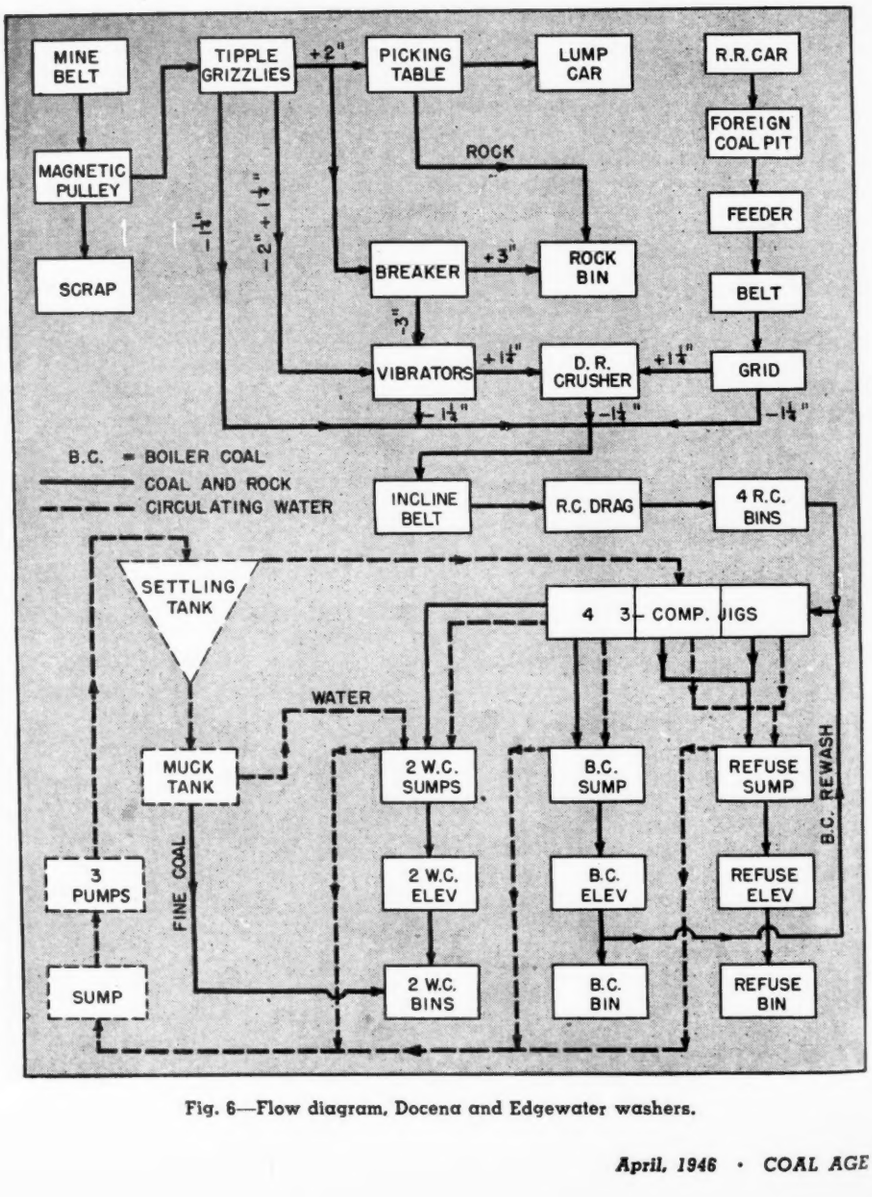


Fig. 6—Flow diagram, Docena and Edgewater washers.

1915 Record

	No. 4	No. 8
Unwashed coal, tons..	226,198	456,787
Washed coal, tons....	210,920	418,598
Ash in unwashed coal, percent.....	10.49	9.79
Ash in washed coal, percent	4.63	5.32
Washer loss or refuse, tons.....	15,278	38,189
Washer loss or refuse, percent.....	6.75	8.36
Free coal in refuse, tons.....	474	5,784
Free coal in refuse, percent.....	3.10	14.10

The centrifugal dryers at Pratt No. 8 did not prove adaptable to the operation, because at that time no method for handling the fines from the settling tank had been developed. Although the dryers reduced the moisture content of the large coal considerably, the final moisture content of the coal was very nearly the same as that from the other washers when the fine coal from the settling tank, which carried 60 to 75 percent moisture, was loaded into the washed-coal railroad cars.

Due to abnormal demands for washed Pratt coal, the Big Oven washer was put back into operation in October, 1915, and work was begun on the construction of the Docena and Edgewater washers early the next year. These washers, each designed for 220 tons per hour, were completed in 1917, and the Big Oven washer was again shut down. However, a fire destroyed one of the washers belonging to Republic Iron & Steel Co. in 1918, and arrangements were made for it to ship 198,256 tons of coal to Big Oven washer for cleaning. This cleaning, together with the crushing of some mine-run coal for coking, continued into 1919, in which year this plant was shut down permanently.

A new three-jig washer was put into operation at Bayview mine on Dec. 1, 1919. This washer used Elmore jigs for cleaning the coal and a Bradford breaker for handling the large coal and rock as received from the mine.

During this period, refuse was disposed of by railroad and electric larries. These methods were continued until 1929, when a new plant using a belt conveyor was put into operation. This plant, located at Hamilton mine, employed an 18-in. belt conveyor in moving the refuse from the plant to the dump—a distance of 750 ft. The refuse was spread out on the dump by two 4-in. streams of water. By 1930, Wylam (Pratt No. 8) and Edgewater washers had changed to belt haulage of refuse. Docena, which had been using the electric larry, continued its use until 1939, when it changed to truck haulage. Wylam, Edgewater and Hamilton washers changed to truck haulage in 1942. Edgewater made the change because the water used in spreading the refuse became highly acidified through contact with the refuse, thereby contaminating the company's industrial water supply, into which it flowed at Bayview lake. The Hamilton and Wylam plants made the change because the quantity of refuse produced was becoming too great for the conveyors to handle and the dumping areas available to the conveyors were practically exhausted.

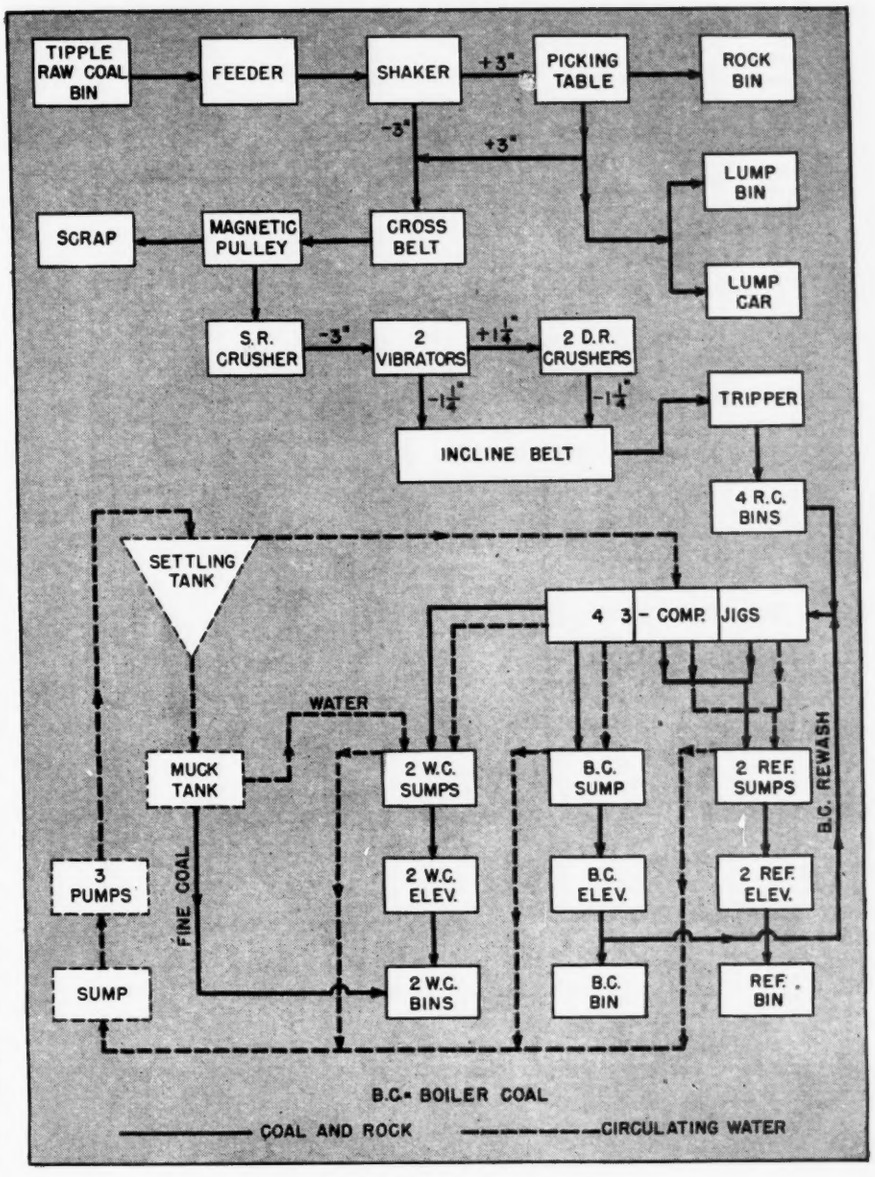


Fig. 5—Flow diagram, Wylam washer.

The first Baum-type jigs were installed in 1943 and 1944 at the Docena and Edgewater washers. These were replacements for Elmore jigs that had worn out. A new plant utilizing two Jeffrey Baum-type jigs as primary washers and one Jeffrey diaphragm jig for rewash purposes also was put into operation at Short Creek mine in 1944. This washer, the latest acquired by the company, is one of the most modern plants in the country at the present time.

Today the Tennessee Coal, Iron & R.R. Co. is operating five coal mines: Hamilton, Wylam, Docena, Edgewater and Short Creek. During 1944, these mines produced 4,411,325 tons of mine-run coal with a yield of 3,278,813 tons of usable coal. The difference between these two tonnages—1,132,512 tons of refuse—represents a major problem in coal washing and refuse disposal. To meet this problem the company has a coal-washing plant at each of these mines.

The coal washed at the Hamilton

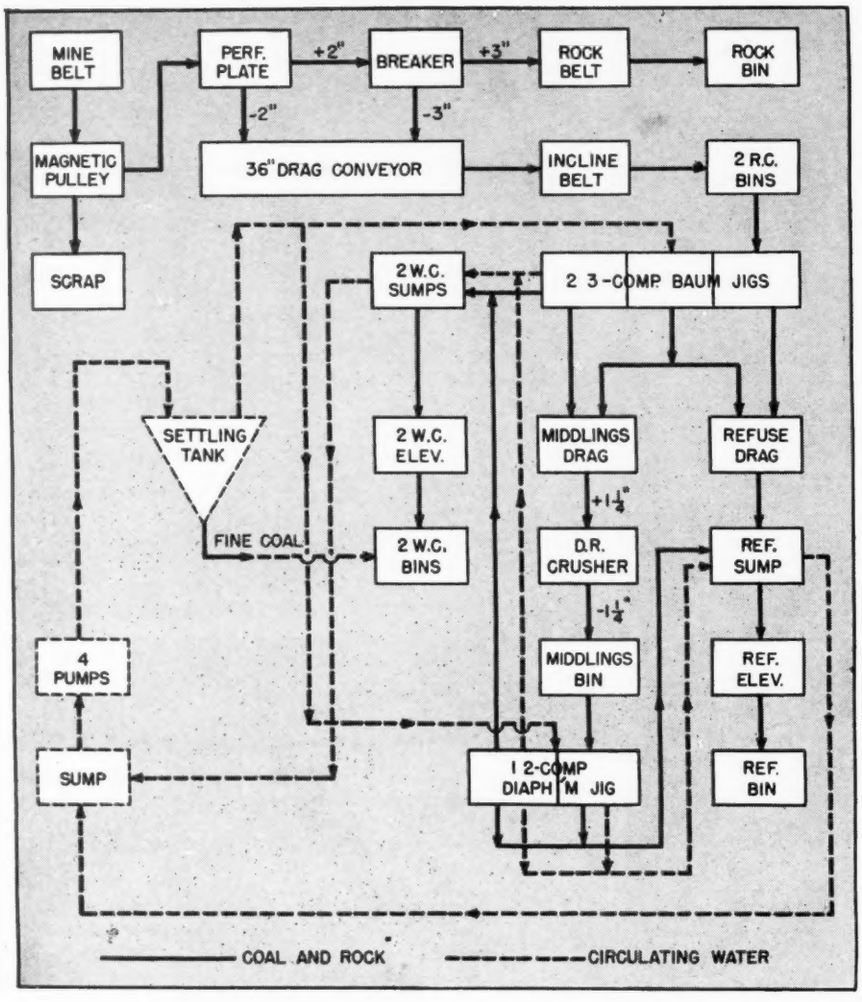
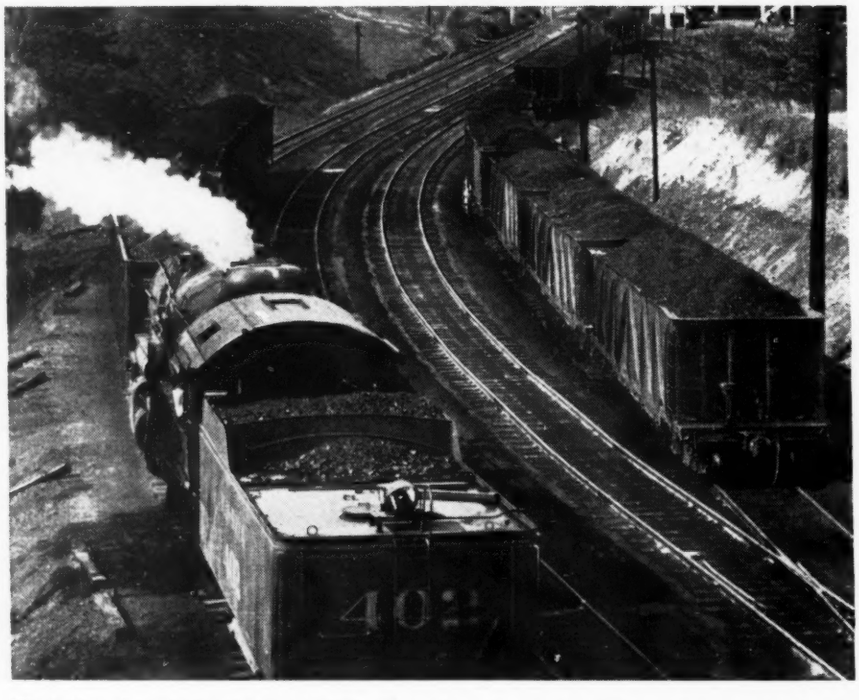


Fig. 7—Flow diagram, Short Creek washer.



Washed coal ready for shipment at Hamilton mine. It goes by rail over the company's own system to the byproduct coke department, at Fairfield, Ala.

plant comes from the Mary Lee seam. This coal has a high inherent ash, which makes a thorough cleaning job a necessity. While the major objective at this and the other plants is decreasing the ash content of the coal to coking standards, the sulphur content, already low, also is further reduced in the process. Operation at Hamilton is divided into five different phases: (1) crushing and screening, in which the product is reduced to a size that can be handled by the jigs and in which some of the impurities are eliminated; (2) washing, where the additional impurities are removed from the coal; (3) dewatering and loading, where the coal is removed from the cleaning medium and loaded for shipping; (4) refuse disposal, in which the refuse is removed from the plant; and (5) water circulation—the life blood for the washing stage.

The coal mined at Wylam is from both the American and Pratt seams, with American coal predominating. In addition to Wylam coal, this plant also washes coal (referred to as foreign coal) imported from mines other than those operated by this company. In 1944, about 200,000 tons of this coal was handled. The Wylam washer, in addition to cleaning foreign coal, differs from the Hamilton plant in that it has a picking table available for use in loading lump coal. Also, the jigs are equipped differently: the boiler coal may either be loaded out or rewashed for coking, and the muck from the settling tank is processed by classifier rather than by screen.

Equipment and operation at the Docena and Edgewater washers are practically identical. The raw coals treated at these plants are from the Pratt seam, but the tonnage handled at Edgewater is considerably the greater of the two. In addition, it is much dirtier. Shakers, picking tables and single-roll crushers are employed at these plants in handling the large rock instead of the breakers and grizzlies employed at the other plants. The washing is done by Elmore and Baum jigs.

Pratt seam coal also is mined at Short Creek. The mine-run carries a high percentage of impurities much of which is large rock. The coal itself is quite friable and consequently usually contains an extremely high percentage of fines. This plant washes a larger sized product (2x0 in.) than the other plants. Because of this, less crushing and screening is required. The cleaning is done by Baum-type and diaphragm jigs, and only two products are made: washed coal and refuse.

TONS PER MAN RAISED

By Use of Machines at Bituminous Mines

Bituminous Strip and Hand-Loading Mines Show Gains in Individual Productivity in 1944—Margin of Loading Machines Over Hand-Loaded Conveyors Rises—Productivity Also Rises With More Mechanization

By W. H. YOUNG
Chief

And R. L. ANDERSON
Assistant Chief
Bituminous Coal Section
U. S. Bureau of Mines
Washington, D. C.

BITUMINOUS-COAL-MINE STATISTICS on employment and working time, as collected by the Bureau of Mines, do not reveal productivity separately on underground tonnage loaded mechanically and by hand due to the inability of the producer to allocate employment. However, a separation has been made that shows over-all productivity for the following groups of mines: (1) strip mines; (2) underground mines with 90 percent or more of output mechanically loaded; (3) underground mines using loading devices but with less than 90 percent of output loaded mechanically; and (4) underground mines without loading devices (100 percent hand-loaded). These four groups include all bituminous-coal and lignite mines producing 1,000 tons or more annually. In compiling data for the following tables, no mine was split, but all of the tonnage, men, etc., was placed in one of the above four groups.

Average tons per man per day was based on the three following items: (1) total production of marketable coal; (2) average number of men employed underground and on surface during the months when the mine was active, including foremen and supervisors, but excluding coke workers, office force and employees in stores or affiliated industries other than the production of coal; and (3) total number of days the mine and tipple operated during the year.

Devices for loading coal mechanically in underground mines are of two types: those that practically climinate hand

Printed by permission of the director, Bureau of Mines, U. S. Department of the Interior.

Table I—Number of Mines, Production, and Output per Man per Day at Underground Bituminus-Coal and Lignite Mines Using Loading Machines in the United States, by States, in 1943–44[1]

State	1943			1944		
	Number of Mines	Production, Net Tons	Average Tons per Man per Day	Number of Mines	Production, Net Tons	Average Tons per Man per Day
Alabama	7	1,067,431	3.23	7	1,255,029	3.44
Colorado	14	2,056,785	5.34	16	2,168,654	5.45
Illinois	47	39,224,109	8.99	59	45,351,125	8.99
Indiana	22	9,754,685	8.01	20	11,772,176	8.59
Kentucky	38	11,266,458	7.82	45	12,792,520	7.62
Montana (bituminous)	7	1,814,745	7.55	7	1,993,613	7.91
Ohio	21	12,745,117	6.08	23	12,850,739	6.15
Pennsylvania	39	19,049,460	5.59	39	25,343,669	5.99
Utah	12	5,146,094	6.57	13	5,841,743	6.56
Virginia	5	706,900	4.62	6	1,594,887	5.56
West Virginia	73	32,246,199	7.96	83	37,557,185	7.46
Wyoming	14	7,528,465	6.90	15	7,680,658	6.96
All other States[2]	6	794,664	6.41	8	812,902	6.37
Total	305	143,401,112	7.29	341	167,014,900	7.30

[1]Includes mines that load 90 percent or more of output with mobile loaders, duckbills, and scrapers. [2]Include[s] Iowa, Montana and Texas lignite, New Mexico, North Dakota, Oklahoma, Tennessee and Washington.

Table II—Number of Mines, Production, and Output per Man per Day at Underground Bituminous-Coal and Lignite Mines Using Conveyors in the United States, by States, in 1943–44[1]

State	1943			1944		
	Number of Mines	Production, Net Tons	Average Tons per Man per Day	Number of Mines	Production, Net Tons	Average Tons per Man per Day
Alabama	9	1,377,731	3.05	12	2,281,001	2.73
Arkansas	20	985,102	2.79	20	888,644	2.66
Colorado	10	380,057	3.72	12	464,899	4.46
Kentucky	9	837,782	4.56	10	768,724	4.15
Maryland	2	178,942	3.37	3	171,291	3.24
Oklahoma	9	572,416	2.40	8	776,219	3.02
Pennsylvania	16	2,674,619	5.44	11	1,629,221	4.82
Tennessee	6	641,384	4.67	6	712,684	4.82
Utah	4	152,151	3.96	4	215,264	5.33
Washington	5	686,249	3.22	6	673,194	3.18
West Virginia	44	5,653,267	4.81	41	5,738,607	4.71
Wyoming	4	289,570	5.06	5	334,967	4.04
All other States[2]	6	780,755	4.74	5	453,093	3.85
Total	144	15,210,025	4.16	143	15,107,808	3.89

[1]Includes mines that load 90 percent or more of output with hand-loaded conveyors and pit-car loaders.
[2]Includes Illinois, Indiana, Ohio, and Virginia.

Table III—Bituminous Coal and Lignite Production and Average Output per Man per Day by Methods of Mining and Loading in the United States, by States, in 1943

State	Strip Mines		UNDERGROUND MINES								Grand Total All Mines	
			Using Mechanical Loading Devices				With 100% of Output Hand Loaded		Total			
			With 90% or More of Output Mechanically Loaded		With Less Than 90% of Output Mechanically Loaded							
	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day
Alabama	427,039	5.61	2,846,290	3.07	10,010,342	2.98	3,876,649	2.56	16,733,281	2.88	17,160,320	2.92
Alaska	.....	.....	.....	.....	.....	.....	289,232	3.59	289,232	3.59	289,232	3.59
Arizona	.....	.....	.....	.....	.....	.....	11,281	1.74	11,281	1.74	11,281	1.74
Arkansas	302,762	8.26	985,102	2.79	.....[1]	.....[1]	411,508	2.57	1,415,173	2.72	1,717,935	3.08
Colorado	8,917	6.82	2,793,639	4.96	3,188,995	4.29	2,332,641	3.56	8,315,275	4.24	8,324,192	4.24
Georgia	.....	.....	.....	.....	.....	.....	14,385	.90	14,385	.90	14,385	.90
Illinois	16,617,826	18.81	45,796,438	8.64	5,069,865	7.77	5,147,141	3.45	56,013,444	7.52	72,631,270	8.72
Indiana	13,310,466	14.91	10,396,671	7.79	.....	.....	1,357,446	3.86	11,754,117	6.97	25,064,583	9.72
Iowa	665,588	8.58	.....[1]	.....[1]	.....[1]	.....[1]	1,672,371	3.06	2,105,022	3.23	2,770,610	3.80
Kansas	3,033,500	12.92	.....	.....	.....	.....	403,281	1.80	403,281	1.80	3,436,781	7.50
Kentucky	1,945,384	17.21	12,676,327	7.26	17,422,036	4.23	31,167,726	4.20	61,266,089	4.62	63,211,473	4.72
Maryland	123,723	10.51	178,942	3.37	.....[1]	.....[1]	1,413,764	3.56	1,809,657	3.59	1,933,380	3.75
Michigan	.....	.....	.....	.....	.....[1]	.....[1]	.....[1]	.....[1]	168,615	2.36	168,615	2.36
Missouri	3,383,990	12.30	.....	.....	.....	.....	925,646	2.23	925,646	2.23	4,309,636	6.24
Montana (bituminous)	2,576,627	75.73	2,005,731	7.29	.....[1]	.....[1]	166,851	4.22	2,192,039	6.86	4,768,666	13.48
Montana-Texas (lignite)	131,679	19.09	.....[1]	.....[1]	.....	.....	.....[1]	.....[1]	76,848	5.53	208,527	10.03
New Mexico	.....	.....	.....[1]	.....[1]	.....[1]	.....[1]	736,464	2.23	1,850,827	3.25	1,850,827	3.25
North Dakota (lignite)	1,749,722	17.42	.....[1]	.....[1]	.....[1]	.....[1]	229,468	4.22	750,480	6.08	2,500,202	11.17
Ohio	9,489,716	14.32	13,831,988	5.95	2,631,847	4.61	6,301,442	3.97	22,765,277	5.08	32,254,993	6.27
Oklahoma	1,449,244	12.24	740,694	2.74	.....[1]	.....[1]	623,290	2.39	1,388,103	2.57	2,837,347	4.31
Oregon	.....	.....	.....	.....	.....	.....	1,200	1.43	1,200	1.43	1,200	1.43
Pennsylvania	17,993,485	13.71	26,148,774	5.52	47,896,399	4.69	49,011,156	4.12	123,056,329	4.58	141,049,814	5.01
South Dakota (lignite)	39,059	7.22	.....	.....	.....	.....	1,605	3.34	1,605	3.34	40,664	6.90
Tennessee	1,877	12.51	1,093,997	4.80	3,034,925	3.91	3,048,119	3.41	7,177,041	3.78	7,178,918	3.78
Texas (bituminous)	.....	.....	.....	.....	.....	.....	9,097	1.40	9,097	1.40	9,097	1.40
Utah	.....	.....	5,767,356	6.53	.....[1]	.....[1]	323,026	4.87	6,665,936	6.18	6,665,936	6.18
Virginia	.....	.....	1,603,461	4.34	6,075,905	4.72	12,600,843	3.81	20,280,209	4.09	20,280,209	4.09
Washington	27,134	15.52	700,625	3.11	319,579	3.20	480,206	3.45	1,500,410	3.24	1,527,544	3.28
West Virginia	6,088,271	15.66	46,698,706	6.92	65,152,389	5.00	40,864,943	4.37	152,716,038	5.25	158,804,309	5.38
Wyoming	319,166	12.31	8,582,334	6.59	.....[1]	.....[1]	161,406	3.58	8,835,957	6.44	9,155,123	6.55
Undistributed	.....	.....	704,954	7.13	2,438,642	4.14	116,754	2.92	.....	.....	.....	.....
Total	79,685,175	15.15	183,552,029	6.62	163,240,924	4.61	163,698,941	3.97	510,491,894	4.89	590,177,069	5.38

[1]Included under "Undistributed."

shoveling and those that greatly reduce the labor involved in hand shoveling. Devices in the first category include mobile loaders, scrapers, and self-loading conveyors or duckbills and are designated as "loading machines." Those in the second category include hand-loaded conveyors and pit-car loaders and are designated as "conveyors." Comparative data for the years 1943-44 on mines that loaded 90 percent or more of their total output with "loading machines" only are shown in Table I. Table II shows similar data for mines that loaded 90 percent or more of the total output with "conveyors" only. In addition to the mines shown in Tables I and II, 90 other mines used both "loading machines" and "conveyors" at the same mine during 1944. This group of mines produced 26,222,722 tons with an average of 5.44 tons per man per day. These three groups of mines: (1) using "loading machines" only; (2) using "conveyors" only; and (3) using both "loading machines" and "conveyors" at the same mine, include all underground mines that loaded 90 percent or more of the total output mechanically.

In each State for which there are comparative figures, the mines using "loading machines" only show higher average tons per man per day than those

Table IV—Bituminous Coal and Lignite Production and Average Output per Man by Methods of Mining and Loading in the United States, by States, in 1944

State	Strip Mines		UNDERGROUND MINES								Grand Total All Mines	
			Using Mechanical Loading Devices				With 100% of Output Hand Loaded		Total			
			With 90% or More of Output Mechanically Loaded		With Less Than 90% of Output Mechanically Loaded							
	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day	Production, Net Tons	Average Tons per Man per Day
Alabama	1,198,618	8.04	5,000,411	2.86	9,045,719	3.08	3,507,417	2.60	17,553,547	2.91	18,752,165	3.03
Alaska	.....	.....	.....	.....	.....	.....	348,375	3.65	348,375	3.65	348,375	3.65
Arizona	.....	.....	.....	.....	.....	.....	6,081	2.18	6,081	2.18	6,081	2.18
Arkansas	636,264	8.89	888,644	2.66	.....[1]	.....[1]	406,653	2.97	1,336,177	2.74	1,972,441	3.53
Colorado	15,680	11.61	2,861,543	5.21	3,336,570	4.31	1,953,920	3.78	8,152,033	4.43	8,167,713	4.44
Georgia	.....	.....	.....	.....	.....	.....	24,285	.96	24,285	.96	24,285	.96
Illinois	17,979,872	20.26	50,242,604	8.76	2,018,919	5.45	6,550,054	4.64	58,811,577	7.83	76,791,449	9.14
Indiana	14,126,145	17.14	12,490,635	8.33	.....[1]	.....[1]	1,222,317	4.47	13,835,738	7.66	27,961,883	10.63
Iowa	511,710	8.03	.....[1]	.....[1]	.....[1]	.....[1]	1,259,540	3.04	1,629,226	3.29	2,140,936	3.83
Kansas	3,079,976	12.67	.....	.....	.....	.....	289,111	1.69	289,111	1.69	3,369,087	8.13
Kentucky	5,273,991	19.80	14,480,828	7.16	21,594,734	4.28	30,006,444	4.47	66,082,006	4.79	71,355,997	5.08
Maryland	132,185	10.30	171,291	3.24	.....[1]	.....[1]	1,364,891	3.52	1,738,317	3.53	1,870,502	3.70
Michigan	.....	.....	.....	.....	.....[1]	.....[1]	.....[1]	.....[1]	139,938	2.81	139,938	2.81
Missouri	4,050,234	14.51	.....	.....	.....	.....	728,418	2.27	728,418	2.27	4,778,652	7.97
Montana (bituminous)	2,513,385	73.52	2,144,307	7.67	.....[1]	.....[1]	72,595	3.44	2,278,955	7.27	4,792,340	13.79
Montana-Texas(lignite)	105,668	16.99	.....[1]	.....[1]	.....	.....	.....[1]	.....[1]	55,573	5.32	161,241	9.68
New Mexico	.....	.....	.....[1]	.....[1]	.....[1]	.....[1]	612,874	2.43	1,743,674	3.64	1,743,674	3.64
North Dakota (lignite)	1,656,467	18.04	.....[1]	.....[1]	.....[1]	.....[1]	13,653	1.03	709,625	8.48	2,366,092	13.48
Ohio	11,663,139	15.35	14,033,459	6.10	2,343,569	4.55	5,836,888	4.08	22,213,916	5.23	33,877,055	6.77
Oklahoma	1,651,583	12.31	929,212	3.23	.....[1]	.....[1]	594,886	2.71	1,556,951	3.01	3,208,534	4.92
Oregon	.....	.....	.....	.....	.....	.....	1,453	1.04	1,453	1.04	1,453	1.04
Pennsylvania	22,532,054	13.73	33,443,976	5.85	44,011,675	4.62	46,064,710	4.27	123,520,361	4.75	146,052,415	5.28
South Dakota (lignite)	25,422	5.81	.....	.....	.....	.....	1,405	2.41	1,405	2.41	26,827	5.42
Tennessee	111,071	9.12	1,461,717	4.73	2,729,925	3.88	2,963,334	3.78	7,154,976	3.98	7,266,047	4.02
Utah	.....	.....	6,159,755	6.50	.....[1]	.....[1]	367,039	5.13	7,119,261	6.23	7,119,261	6.23
Virginia	161,991	16.02	1,963,505	5.19	7,594,027	4.31	9,794,351	3.73	19,351,883	4.06	19,513,874	4.08
Washington	60,426	10.73	686,449	3.17	313,520	2.98	463,746	3.12	1,463,715	3.11	1,524,141	3.20
West Virginia	12,840,600	15.72	51,887,289	6.68	61,870,844	5.06	38,105,037	4.44	151,863,170	5.32	164,703,770	5.61
Wyoming	571,895	15.80	8,827,201	6.59	.....[1]	.....[1]	136,681	3.34	8,968,117	6.49	9,540,012	6.73
Undistributed	.....	.....	672,604	7.14	2,691,025	4.73	85,749	3.26	.....	.....	.....	.....
Total	100,898,376	15.89	208,345,430	6.60	157,550,527	4.56	152,781,907	4.15	518,677,864	5.04	619,576,240	5.67

[1]Included under "Undistributed."

using "conveyors" only. This higher average productivity for the United States of loading machines over conveyors increased from a margin of 3.13 tons per man per day in 1943 to 3.41 in 1944.

Table III shows 1943 bituminous-coal and lignite production and productivity, by States and by methods of mining and underground loading. Similar data for 1944 are shown in Table IV. These methods of mining and underground loading have been separated into four groups: (1) strip mines; (2) underground mines with over 90 percent mechanical loading; (3) underground mines with less than 90 percent mechanical loading; and (4) underground mines with 100 percent hand loading.

Within the same State productivity is higher in strip mines than at underground mechanized mines; however, Illinois and Indiana underground mines, with 90 percent or more of output mechanically loaded, averaged more tons per man per day in 1944 than strip mines in Alabama, Iowa and South Dakota.

At underground mines the productivity generally increases as the percentage of output mechanically loaded increases. During 1944 the following States: Colorado, Illinois, Ohio, Tennessee, Vir-

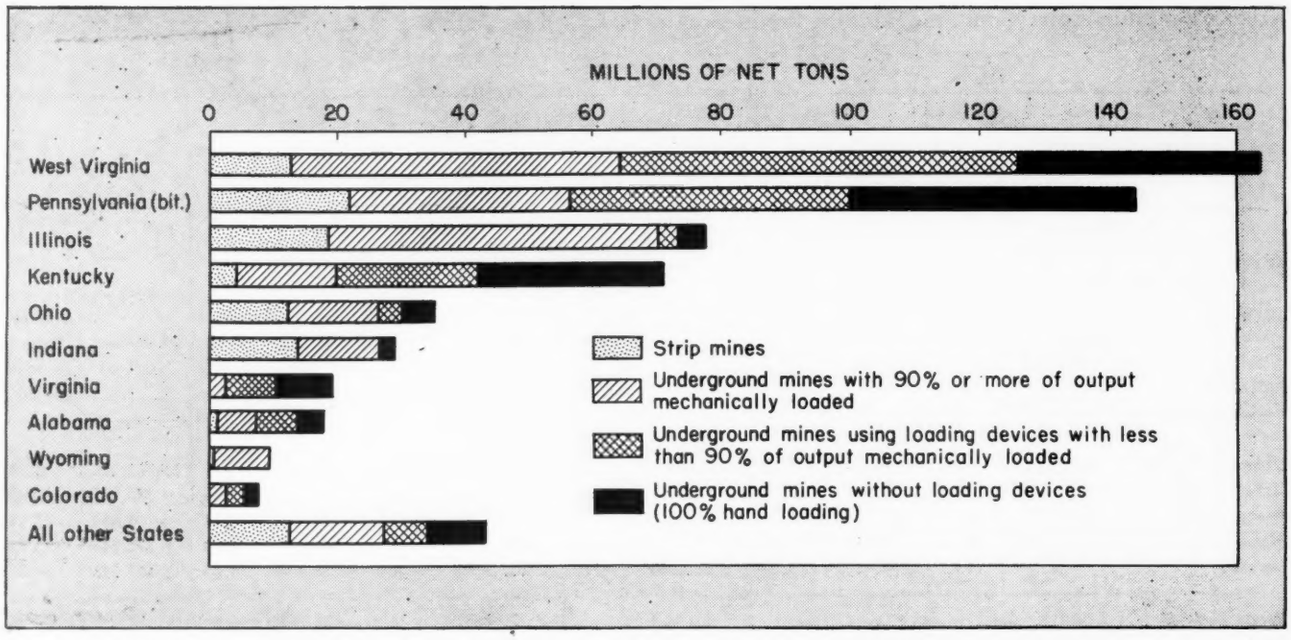


Fig. 1—Production by methods of mining and underground loading in the ten largest and all other coal-producing States in 1944.

ginia and West Virginia, each showed increasing productivity in this order. The average for all underground bituminous-coal and lignite mines was 4.15 tons per man per day at mines that had no mechanical loading devices, 4.56 at mechanized mines with less than 90 percent of output mechanically loaded, and 6.60 at mines with 90 percent or more of output mechanically loaded.

Figs. I and II show graphically the production and productivity by methods of mining and underground loading for the ten largest coal-producing States in 1944.

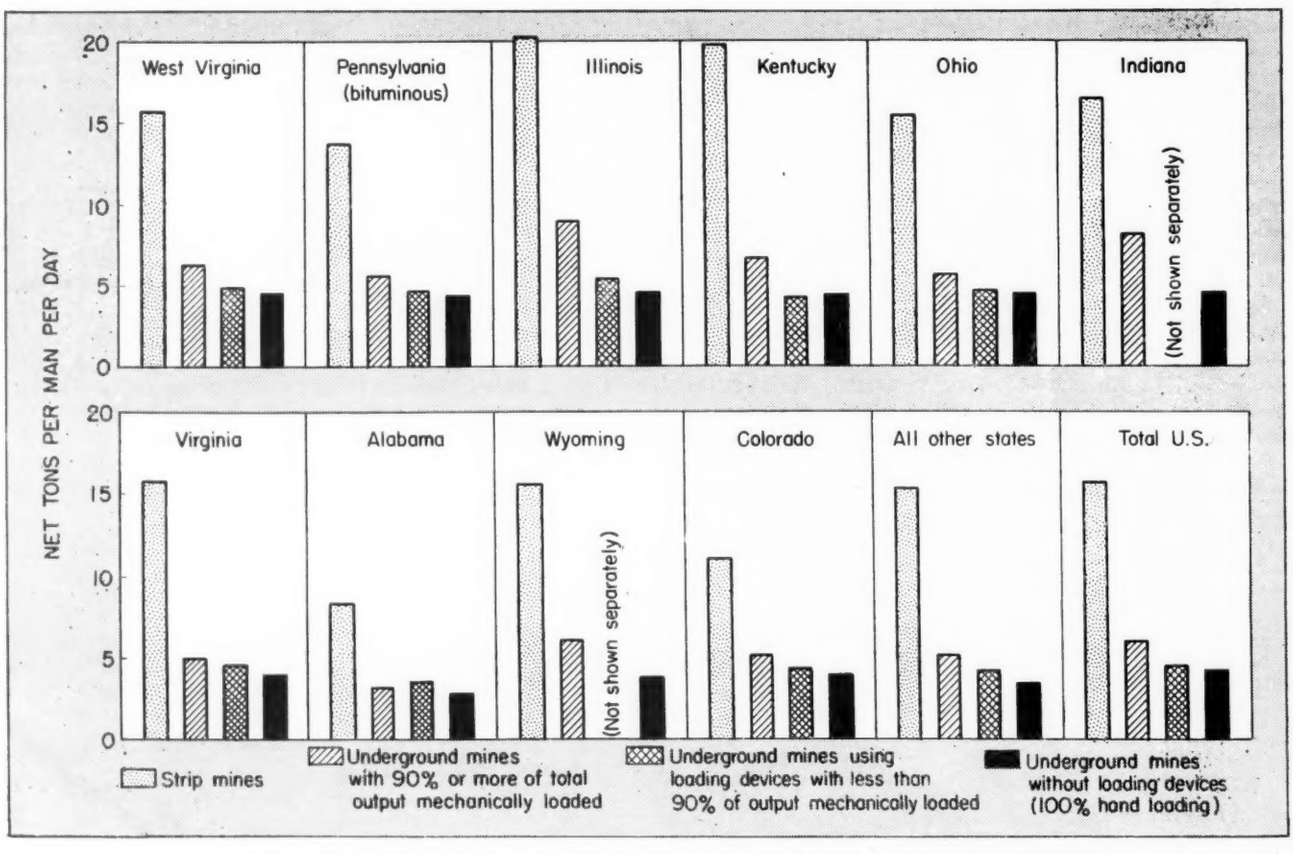
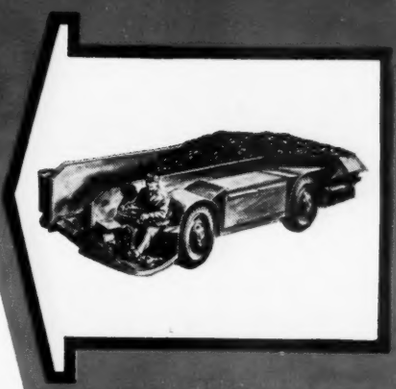


Fig. 2—Output per man per day at bituminous and lignite mines by methods of mining and underground loading in the ten largest coal-producing States and the entire United States in 1944.

SAFE POWER





EXIDE-POWERED SHUTTLECARS SPEED UP HAULAGE, CUT COSTS

There is no idle loader time and no long waits at the main line, when gathering is delegated to fast, flexible shuttlecars and safe Exide-Ironclad power. Tonnage figures climb, haulage costs go down, profits rise, and mining hazards are reduced.

Exide-Ironclads for shuttlecars, locomotives and trammers have the *high power ability* that frequent "stop and go" service demands . . . a *high maintained voltage* throughout discharge . . . and a *high capacity* that assures full shift availability and sustained speeds throughout the day. Exide-Ironclad construction is assurance of these dependable qualities PLUS safety, long-life and ease of maintenance.

If you have a special battery problem, or wish more detailed information, write for booklet Form 1982.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32

Exide Batteries of Canada, Limited, Toronto



The Foremen's Forum

All-Around Stemming Subdues Flame in Creviced Coal

Sheathing Cartridges With Bicarbonate of Soda Cuts Methane Ignitions—Short Plug of Same or One of Wet Clay Affords Further Protection

MANY A DRILLHOLE in coal breaks into a crevice or crevices so wide as to be visible on the outside of the hole or, in any event, discoverable when the hole is diligently explored, either with the scraper or with some special tool. In that case, the flame from the explosive is likely to pass into such a crevice. These crevices are ports more or less open to the otherwise sealed borehole. The crevice may or may not have a vent, but in any case, it will be likely for weal or for woe to have a higher methane content than the air at the mine face, for the methane in large or small quantity is leaving the coal all the time and driving out the air in front of it.

New Non-Methanous Crevices May Lead to Old Gassy Ones—Creviced coal is dangerous even if the drillhole does not penetrate a crevice, because the disruptive action of the shot may develop other crevices, so that the flame will pass through the circular periphery of the hole into an older crevice, which, being older, probably will contain methane. These incendiary emissions may set fire to the methane that the crevice, new or old, contains, if the methane content makes the mixture combustible and explosive. It will be said doubtless that the range of combustibility is between 5 and 15 percent of methane, but under the pressure that is created by the shot the range may be quite different and wider in both directions. Also, the temperature range may be greater with a shot than with a flame, for the shot may be hotter and the detonation may intensify the chemical reaction. On the other hand, the incombustible products of the explosion, such as the decomposition of the bicarbonate of soda of a sheathed shot, may have a contrary and controlling effect.

Methane May Prevent an Explosion—However, an explosion is quite likely to occur, not necessarily in the more methanous mine, because in such a mine there may be too much methane to explode, and in a mine generating an insufficient quantity of methane to show a cap at the face there may be a sufficiently large percentage in a crevice to participate in a severe explosion, the methane from the coal before and at the moment of shooting effectively keeping the air from entering the crevice.

What Makes Crevices in Coal

(a) Mining Contiguous Seams
(b) Mining at Great Depth
(c) Mining by Longwall
(d) Drawing Pillars
(e) Inadequate Pillars
(f) Ageing of Lignite and Coal
(g) Heavy Shooting
(h) Shooting Coal by Sections
(i) Creeps or Squeezes
(j) Approaching Old Workings

The hole may bleed the crevice of much of its methane, but, after the hole is stemmed and duly tamped to its mouth, the percentage of methane may rise, and conditions become favorable for an ignition, to be followed by an explosion. This happens more often than perhaps is thought, but conditions at the face—the lower methane content and the open space for expansion—may prevent the extension of such violence.

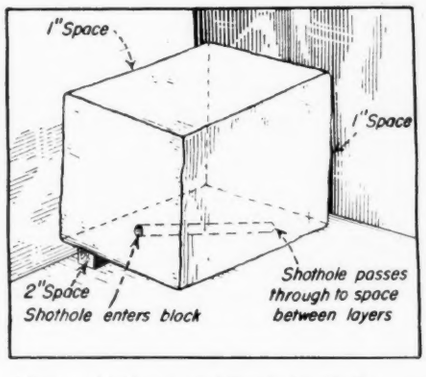
The explosion may be augmented by the explosive combustion of coal dust even if the hole is scraped clean, for, where the crevice is open to the hole, some of the borings are sure to be swept in either by the auger or the scraper or both. This is another hazard of the creviced hole. Where there is a sizable crevice, the cartridge is not hemmed in by solid walls and tight stemming, but, at least in the direction of the crevice, is practically unstemmed. The exposure may be there, even if it is not seen or even when it cannot be felt by the point of a searching tool.

Sheathed Explosives Reduce Risk—To prevent this most obvious defect—the incomplete inclosure of the cartridge—and also to reduce the temperature of the flames escaping from the explosive, the sheathed cartridge was introduced, a Belgian innovation that has been used somewhat in this country also. This coating not only cools but separates and thus, in a sense, dilutes the flames, just as rock dust does, though the cooling effect of the bicarbonate is much greater. It also smothers the fire with the carbon dioxide emitted by the coating. Powdered bicarbonate of soda is laid within the paper wrapper enveloping the explosive. According to H. C. Grimshaw, in *The Iron and Coal Trades Review*, "Since 1934, sheathed explosives have been adopted in the majority of the coal mines of Great Britain."

Early experiments appeared to show that when the cartridges were sheathed at the ends as well as at the cylindrical sides, the result attained was no better than when the sheathing was confined to the cylindrical face of the shot, but it could not be overlooked that the crevicing was not all confined to that portion of the borehole adjacent to the curved faces of the cartridge, so it was suspected that a fore-end plug nevertheless might prove helpful.

How Test Was Made

Sandstone Block Used to Simulate Crevicing—Experiments have been made to ascertain the effect of crevices in coal and to determine the value of sheathed explosives and the best way of employing them. A rectangular 4x3x3-ft. block of sandstone resting



How a block of sandstone dropped in a shallow pit is used to simulate a creviced block of coal.

Here is Sound Engineering Service for Your

CABLE PROBLEMS

The same engineering knowledge which helped build this Heavy-Duty Securityflex cable is available for consultation on your cable problems. Anaconda engineers think in terms of reliability plus safety. Call or write nearest district office. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y., Sales Offices in Principal Cities.

40297

CUTS COSTS — PROMOTES SAFETY



These features give you long, trouble-free wear

ABRASION AND OIL RESISTANCE

All Anaconda Securityflex cables have a tough *Neoprene Jacket* for maximum abrasion and oil resistance.

NO KINKING

Anaconda engineered construction eliminates kinking —a nuisance not encountered with Anaconda Securityflex.

FIRE RESISTANCE

The specially compounded Neoprene Jacket plus heat resistant insulation makes Securityflex the safest cable possible.

NO LOOSE JACKETS

Special bonding process eliminates cable failures from loose jackets.

ANACONDA *Securityflex* **CABLE**

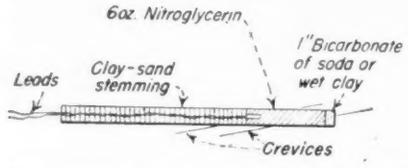
ANACONDA
from mine to consumer

in a pit lined with concrete and so tilted as to leave wedged-shaped spaces beneath, behind and beside the block has been used for this purpose. It has been found that placing a pad of such sheathing as stemming at the fore, or inby, end of the sheathed cartridge is of definite advantage.

Around the block and in the wedge-shaped spaces simulating crevices, the atmosphere contained 9 percent of methane, about the content needed to produce the most violent explosion of methane with air. A hole about 3 ft. long was drilled in the block sloping downward to latter's underface and a charge of 6 oz. of a 10-percent nitroglycerin explosive was pushed down into the hole. After the hole was loaded, it was tamped hard to its mouth with sand-clay stemming. The detonator had been placed in the charge at the stemming end, as is customary in what is known as "firing by direct initiation." The results obtained are indicated in the accompanying table.

Ignitions With Cartridge Unsheathed, Sheathed and With Stemming in Front as Well as Behind Charge

Series	Conditions	Number of shots	Ignitions	Percent
1	Charge not sheathed	9	7	78
2	Charge sheathed with bicarbonate of soda	19	3	16
3	Similar sheathed charge with a 1-in. bicarbonate-of-soda plug at fore end	18	2	11
4	Similar sheathed charge but with 1-in. plug of moist clay at fore end	17	0	0

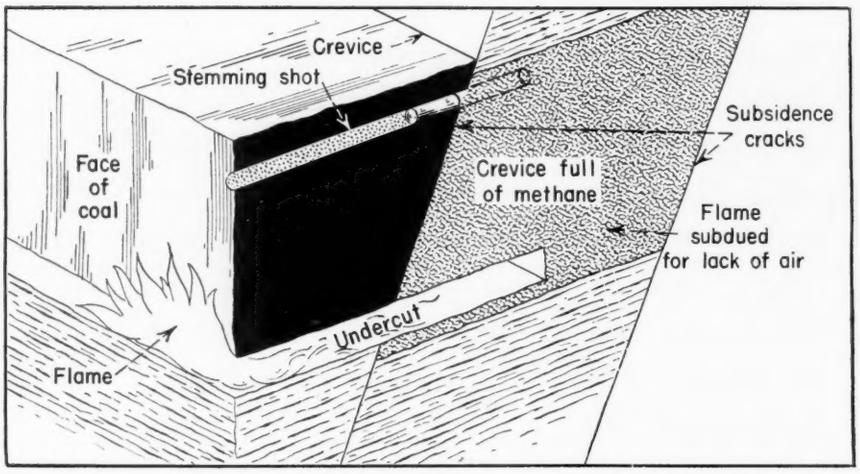


Test ensemble—6 oz. of nitroglycerin in a hole 3 ft. long with 1-in. plug of bicarbonate of soda or wet clay stemmed with sand-clay mixture to mouth of hole.

More Tests Needed—Because an insufficient number of tests were made, Mr. Grimshaw declares that too much confidence should not be placed on the protection against a possible ignition that a plugging of the fore end of the drillhole will afford. It should not be assumed that moist clay will prevent an ignition in every case, as it did in the foregoing tests, but the tests show, he believes, that a plug at the fore end of the hole is of assistance if the crevice is at that end, and he recommends its use, as a protection, should the presence of such a crevice be overlooked or ignored by the shotfirer.

In comment, it may be said that where one seam is being mined above another, crevicing in the upper seam is to be expected and feared and possibly in the lower also, and precautions must be taken against it. In Great Britain, this occurs more often than here, but there are many operations in the United States where two or more seams are being removed.

This test was a severe one. The percentages are fair as between the four series of tests, but unfair, perhaps, as between them and actual mining conditions. In practice, the nitroglycerin used in the tests is not employed for bringing down coal, crevices are rarely if ever as large and numerous as in the test, nor do such crevices always have 9 percent of methane. They may have more or less. This is not a criticism. Test conditions always should be more severe than are those encountered in general operation, for an accident should be an extremely unusual occurrence and not one avoidable only under standard conditions.



Crevices in a shothole are open ports for emission of flame and admission of coal dust and also storehouses for firedamp. The explosive may make only a short flame, but the methane makes a long one and frequently when ignited continues to burn.

Too Few Tests Made

Does Hazard Drop From 78 to 0 Percent?—It is remarkable how the hazard drops from 78 percent to 16 when the shot is sheathed. One at first is disposed to say that if the cartridge were pushed to the end of the hole, its unsheathed end could do no harm, but the crevices may not all be in the periphery of the drillhole. One, perhaps the only one, may occur on its end or in an extension from some point on the circumference of the hole.

The upper sketch, not from any British source, shows the possibilities of danger with creviced coal. The coal seam below that being in process of extraction has been mined long ago, and subsidence has resulted in crevices along the subsidence cracks and between the subsided coal and the coal that has not subsided. As a result there is a block of coal and rock surrounded on four, if not six, sides by crevices.

These crevices may be small, and flame may find it difficult to maintain itself in them, because the walls cool the gases and because there is in them little air and much methane. The rush of exploded gases from the borehole prevents air from entering from the undercut and aiding in the combustion. Even when the undercut is reached by the flame or unburned gases, the air has a little difficulty in entering, but as the undercut goes all the way across the face it is relatively easy for the air to work its way into the methane and other unburned gases and coal dust after they escape from the crevice.

On reaching the coal face, the gases carrying coal dust with them meet a plentiful supply of air that if any flame, however small, exists will make flame abundant, and the pressure and temperature are such as will create a methane-and-coal dust explosion. The question is, "Will the flame reach the mouth of the undercut, having to travel with a lack of oxygen through narrow cooling walls? The walls may be widened in places, however, by the violence of the explosion, and the high pressures and temperatures may make the escaping flame flare despite these handicaps.

This seems a severe condition. It looks much more menacing in the illustration, however, than in actuality, because the area between the two subsidence cracks at the cross-section appears open, which is true if the crevice is even and vertical, but nothing is revealed, except in this text, as to the width of the crevice; a drawing never shows everything, but a creviced hole will show even less to the man who expects to fire the explosive in it.

End Plug Requested

Clay Plugs and Crevice Detectors With a V Projection Is Officially Recommended—Because of the demonstrated advantage of the use of stemming both fore and aft, however little stemming there may be in the forward position, J. R. Felton, chief inspector of mines of Great Britain, has sent a circular letter to all owners and managers of mines favoring the use of a clay plug at the fore end of every drillhole, at the same time declaring that this will not be an assured cure for a creviced hole. He advocates use of a special crevice detector, a long handle with a V-pointed projection at its end, sturdy enough not to bend readily in use. Nothing is said, in the only available report of the issuance of this letter, as to the use of the clay plug in fissured coal or in coal that is being undermined or overmined in other seams or in coal known to have crevices. It appears to be a recommendation to be applied at all British coal mines without any restrictions whatsoever.



Fishing together costs less

It's economical for coal operators to fish for business from the same boat. It costs less than if each hires his own.

A coal sales company selling diversified tonnage, part of which is yours, can afford to give you better service than an individual sales force supported by your production alone.

No matter how much or how little coal you produce, you can have the advantage of the best professional sales service if you use a coal sales company *where costs are distributed over the output of several mines.*

It has been repeatedly demonstrated that an established selling organization, serving several producers simultaneously, can perform a complete service *at less cost per ton for each* than can most producers doing the job alone.

AMERICAN COAL Sales ASSOCIATION

AMERICAN COAL *Sales*— ASSOCIATION... Washington, D.C.



State-Board Questions

Coal Age Quiz

Timber Should Be Dry

Q.—Why should props be dry when taken into the mine?

A.—(1) Because, in drying, props shorten. Props often dry in the mine so much that the crosspieces and wedges that should be supported become loose and may fall to the floor. If they stay in place, the sagging of the roof after awhile may tighten the props again, but, meantime, the roof is weakened and may fall because it has no support. If the cap pieces and wedges fall, the roof will rarely come down enough to rest on the prop, so there is no support. Usually, if the gob is free from refuse, the prop is so ill-balanced that it will fall.

(2) Because when props are dry, they are much stronger than when wet, because seasoned wood is stronger than wet wood.

(3) Because dry wood does not develop fungus growths that destroy wood. In a house, boards rarely rot, but in a mine they are soon destroyed because the air usually is nearly saturated with water vapor, and the wood can absorb water. Near the mine entrances, and for some distance in, the props become very wet in the summer months and are soon covered with fungus. In the return, timber rarely gets really dry, and fungus development is both rapid and extensive, carbon dioxide and heat aiding in the process. But in the heart of the mine, the props remain relatively dry.

(4) Wet wood causes carbon dioxide to form, which makes the air impure.

(5) Moist timber is a good conductor of electricity and may cause a ground.

The importance of having seasoned timber is greatest where it is for permanent use. In short-time service, it will not dry and shrink much, or develop much fungus or carbon dioxide. Mechanical mining today speeds the abandonment of working places, and the moisture content of posts is not so vital if the timber is not recovered and used again and again, though recovery and reuse is made more possible if the timber is dry.

Posts Should Be Dry Because Dry Posts

(1) Don't Shrink and Fall.
(2) Are Stronger Than Wet.
(3) Don't Develop Fungus.
(4) Don't Make Mine Air Impure.
(5) Conduct Less Electricity.

How to Flameproof

Q.—What is the principle that makes machinery in mines flameproof or permissible?

A.—The same principle that Sir Humphrey Davy and George Stevenson adopted in designing the Davy and Geordie safety lamps respectively and is used in all flame safety lamps—that is, that a flame will pass with great difficulty through a narrow passage, especially if the passage is bounded closely by two good metal conductors, for they conduct away so much heat that the flame is almost or quite extinguished.

In flameproof or permissible equipment, the pressures and temperature are greater than in the flame safety lamp, and more cooling is needed to prevent the emission of flame. In the inclosures of such machinery, there is less opportunity for the release of pressure and for the cooling action than in such lamps but that defect is countered by the much greater length of the passages for escape, and the big volume of metal bounding those passages.

Where Is the Feeler Gage?

It is important that no bolts, capscrews and studs in the covers of switch boxes shall be absent or loose, for otherwise the openings to the inclosure they protect may enlarge and let flame escape. "Holes made by omission of bolts, etc., or by arcs destroy the intended protection of explosionproof casings," says I. C. 6584, U. S. Bureau of Mines. The space between flanges must be wide enough to permit the escape of the gases from an internal explosion so that the switch box will not be broken or breached, but the spaces also must be so restricted that the heat in the flames that try to escape will be cooled so completely that all flames will be suppressed.

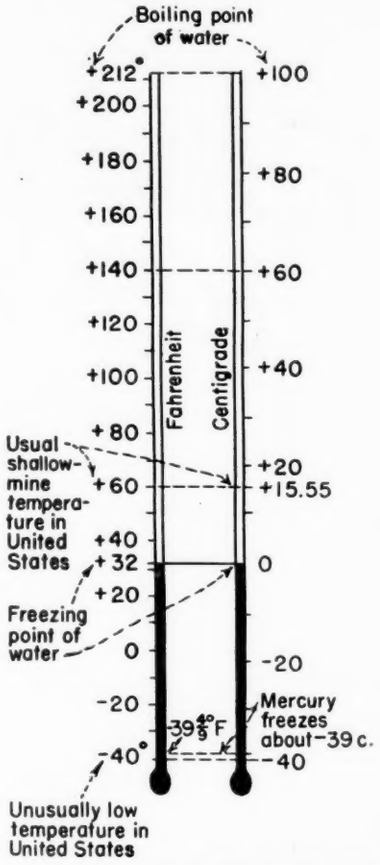
Separation of 0.004 In.

To ascertain how wide these spaces should be, "feeler gages" should be supplied. The spaces between flanges should be narrow enough that they will just exclude these thin feelers. "A separation not exceeding 0.004 in. may be tolerated, but a greater opening than this may permit flames to escape should gas be ignited within the inclosure," says the authority already quoted. In an opening $\frac{1}{4}$ in. wide, 16 such 0.004-in. gages could be inserted one on top of another. This will give an idea how close to each other the sides of the opening should be. Flange joints should, and should continue to, expose metal to a depth of 1 in. between the inclosure and the outer surfaces. All flange surfaces must be kept clean.

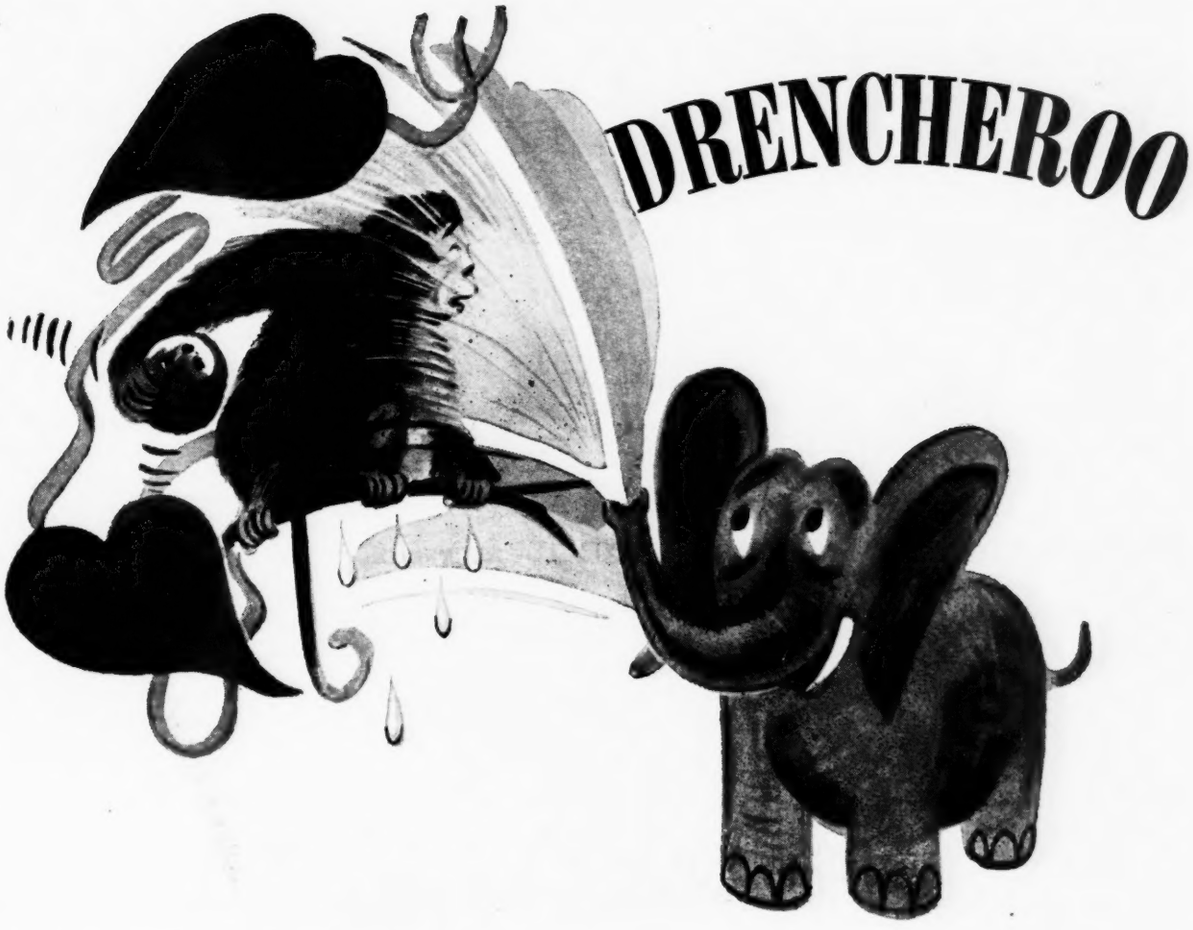
Where Scales Agree

Q.—At what temperature is the degree of heat indicated by the same figure on both the Fahrenheit and Centigrade scales?

A.—Minus 40 deg. C. or F. is the only



Shows that minus 40 deg. designates the same temperature on both the Fahrenheit and Centigrade scales. The two scales differ widely in the figures they indicate for the several temperatures as they diverge up or down from minus 40 deg.



Don't get mad, Monk. Your dousing is only a molehill compared to the mountain of abuse U.S. Royal Cords and Cables must absorb before being certified safety tested.

Precise and scientific laboratory tests, such as for moisture absorption, assure you Cords and Cables that more than meet all requirements—U. S. Royals are also subjected to heating, freezing, bending, stretching and impact tests.

MOISTURE ABSORPTION TEST



Conductor Insulation: **9 inches of insulated conductor are immersed in distilled water at 70° C for 7 days. Conductor is then removed and weighed and amount of water absorbed calculated from the increase in weight—moisture absorption of U.S. Royal does not exceed 25 milligrams per square inch.**



Jacket Compound: **Sample of jacket compound of uniform 0.100 inch thickness with surface material removed is first weighed, then immersed in distilled water at 70° C for 7 days. It is then removed and weighed and the amount of water absorbed is calculated — U. S. Royal Mining Machine Cable jacket absorption not more than 60 milligrams per square inch.**

SPECIFY THE NEW U. S. ROYAL *Safety Tested* MINING MACHINE AND LOCOMOTIVE CABLES

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

SERVING THROUGH SCIENCE WITH ELECTRICAL CORDS AND CABLES

point where the figures for Centigrade and Fahrenheit are alike. If we add 72 deg. to —40 deg. F. we have 32 deg. F., the freezing point of water. Between the freezing point and the boiling point of water is 100 deg. C., and 212 — 32 = 180 deg. F. So 1 deg. C. is $\frac{180}{100}$ times as large as 1 deg. F. Therefore 72 deg. F. =

$$\frac{72 \times 100}{180} = \frac{72 \times 5}{9} = 8 \times 5 = 40 \text{ deg. C.}$$

If we raise the temperature 40 deg. C. from —40 we have 0 deg. C., which is the temperature at which water freezes. This proves that it was right to state that —40 deg. F. is the same temperature as—40 deg. C. It is well to remember that not only because it is an interesting fact but also because it is a convenient means of calculating degrees F. from degrees C. and vice-versa.

Thus 212 deg. F. is 252 deg. F. above —40 deg. F.

$$252 \times \frac{5}{9} = \frac{1260}{9} = 140 \text{ deg. C.}$$

and 140 — 40 = 100 deg. C.

So, 100 deg. C. must be equal to 212 deg. F.

This we know is true because one is the boiling point of water on the Centigrade scale and the other the boiling point of water on the Fahrenheit scale.

Mine Foremen, Pennsylvania

Equivalent Velocities

Q.—In an entry 6 ft. high and 12 ft. wide, the velocity of the air is 600 ft. per minute; what will be the velocity of the air where the airway is 6 ft. high and only 10 ft. wide?

A.—I'm sure I don't know. It may be any velocity, unless some kind of assumption is made. In this case, let us assume that the quantity of air delivered through the heading is unchanged by the change in cross-section. As the headings are both equally high, the areas of the cross-sections are as 10 to 12, so the velocity of the air will be as 12 to 10; hence, as the first velocity is 600 ft. per minute, the new velocity will be 600 × 12 ÷ 10 = 720 ft. per minute.

"Rubbing Surface"

Q.—If the average size of the airway is 6 ft. high × 11 ft. wide and one mile long, what will be the rubbing surface of the airway?

A.—The average height of the airway means much or little, depending on the way in which the changes from high to low roof occur. Places where the rock has fallen cause the air to strike the surface of the roof and form vortexes with consequent resistance. They also increase the area of rubbing surface. The impact of the air on the roof and on the irregularities of the sides is more determinative of resistance than the mere area of rubbing surface, but, because we cannot estimate these impacts or collisions and their effects, we usually adjust the coefficient of friction to the general condition of the passageways in which the air has to travel.

Every Type Must Have Its Own "k"

Some mining men determine a coefficient for various parts of their own mines: a butt heading with rooms or a face heading without such openings or a lined or unlined shaft, or again a heading with many or no timbers across or along its length or finally a gobbed heading with cross-bars.

But, theoretically, as a rough approximation, the rubbing surface is taken as the product of length by perimeter or inner girth. Here, the length is a mile, or 5,280 ft., and the width of the floor as also the width of the roof of the heading is 11 ft., giving a total horizontal rubbing surface of 22 ft., and the height of heading on either side is 6 ft., or a gross height of 12 ft., so the perimeter, or inner girth, is 22 + 12 or 34 ft. The whole "rubbing surface" is 5,280 × 34 = 179,520 sq.ft.

Having a reasonably correct "coefficient of friction," k, for such a surface you are "all set" to determine a correct "rubbing surface," or "impact, or collision, surface" and to figure out the true resistance, but, if the coefficient of friction is not well chosen for the surface thus measured, you do not get the true resistance. If you take it as 0.00000002, as many do, you are likely to get a result that is much too high for that factor, though possibly you will be all right if you apply it to a heading with roof and coal falls and twists with gobs at one or both sides.

The Three Resistances

Q.—Why is the product of length and twice the width and height termed the rubbing surface?

A.—As used, it isn't the rubbing surface but a combination of (1) a rubbing surface and (2) an "impact surface," and it is used as a basis for the resistance of the air due to these surface actions, also (3) to gage the resistance of the air due to its own internal friction in the little tornados it forms and the movement of air against air traveling at greater speed. The air along the exposed surface is scarcely moving whereas in the center it is rushing along pell mell. The rubbing resistance in most mine headings is the least of the resistance builders. Much more important are collision resistance of air when it strikes solids, as at roof offsets and at turns in the roadway, and the resistance of air when it collides with air.

Air Speed Vs. Resistance

Q.—If the velocity of air in the airway is doubled, how much will the resistance be increased? Why?

A.—In general doubling the velocity will multiply the resistance by four, which is reasonable because the particles of air striking and rubbing against the irregularities and roughnesses of the roof, ribs and floor are twice as many and the blow they strike will be twice as hard, for the effectiveness of the blow is as the velocity. In scientific language, the momentum or effectiveness of the blows administered to the material of the perimeter of the heading = mass of air passing multiplied by velocity, according to the formula: Momentum = mv.

But it appears that if the passageway is smooth and the travel of the air is quite slow, then there is no turbulence, and the resistance is proportional to the speed and not to the square of the speed. In between turbulent flow, which we almost always find in mine currents and very sluggish flows, may be found currents that vary in their relations to each other not as the square of the velocity nor as the velocity but in some intermediate degree. $P = \frac{k s v^2}{a}$ but a more correct formula would be $P = \frac{k s v^n}{a}$ where n is equal to some value between 1 and 2. Perhaps only when there is no fan or natural ventilation and the movement of the air is responsive solely to gradual changes in barometric pressure is the resistance directly proportional to velocity.

•

Which to Do: Rectify or Convert

To The Editor:

In reading State Board Questions (December, 1945, p. 126) one might obtain an erroneous impression of the relative efficiencies of the mercury-arc rectifier and the rotary converter, especially as one of the captions reads, "Converter Saves Power." The actual comparison is as follows:

Percentage Efficiencies for Rectifier and Converter at Various Load Factors

Fraction of Rated Load	Efficiency—Mercury-Arc Rectifier	Efficiency—Rotary Converter
¼	88.8	83.5
½	91.1	89.7
1	91.4	91.9
1¼	91.0	91.9
1½	90.7	92.0

Efficiencies become identical at about three-quarters load.

This comparison shows that, for all services below 75 percent of the rated load, there is a considerable saving in power with the mercury-arc rectifier and at 25 percent load this amounts to 5.3 kw. for a 300-kw. unit. At full load, the saving is 1.8 kw. in favor of the rotary converter. Incidentally, it occasionally happens that the rotary transformer losses are overlooked when checking the efficiencies of the rotary converter.

In answering the question, "What efficiency can be expected from a rectifier?" some confusion might have been avoided if a forthright statement had been made of efficiency values for a typical unit at various loads.

R. S. SAGE
Engineer Mining Div.
Indl. Engrg. Divisions
General Electric Co.

DEPENDABLE DRILLING TOOLS... BACKED BY DEPENDABLE DISTRIBUTORS

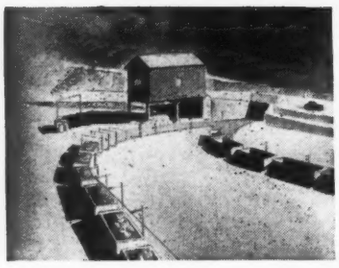


To assure you quicker deliveries and better service, COALMASTER "Matched Set" Tools and Bits are now stocked in strategic locations throughout America by these nationally-known firms:

- **AUSTIN POWDER COMPANY, Cleveland, Ohio**
- **THE BUDA COMPANY, Harvey, Illinois**
- **DIAMOND SUPPLY COMPANY, INC., Evansville, Indiana**
- **DOOLEY BROTHERS, Peoria, Illinois**
- **ILLINOIS POWDER MFG. CO., St. Louis, Missouri; Denver, Colorado; Salt Lake City, Utah**
- **SALEM TOOL COMPANY, Salem, Ohio**

DRILLING COALMASTER TOOLS

CENTRAL MINE EQUIPMENT COMPANY • ST. LOUIS 8, MO.



Operating Ideas

Track-Dump Valve Passes Rock But Stops Man

AN OTHERWISE perfect slate-dumping and disposal arrangement at the new Reels Cove mine of the Tennessee Products Corp., Whitwell, Tenn., had one peculiar disadvantage. It was overcome by installing swinging gates in the dump hopper that will not let a man through but will allow the rock to pass. What business have men in the dump? None, but since the hopper—a track unit for drop-bottom cars—is practically in the mine yard a man might fall into it. Without the gates his chances of survival would be very slim because the steel plates of the hopper bottom, or chute, are continuous to the edge of a rock cliff 150 ft. high.

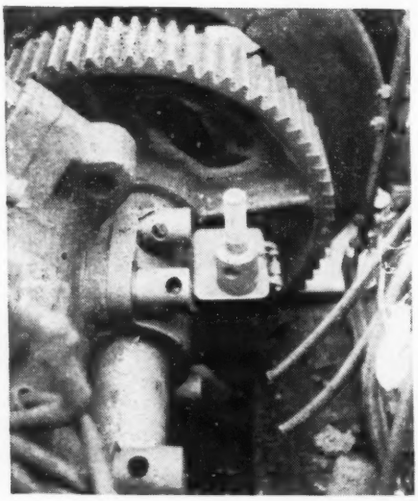
As shown in the illustration, the gate is in two sections. Each consists of two planks supported by hangars pivoted to the I-beam supporting the outer rail. The edge of the bottom plank is shod with an angle iron to prevent splintering and rapid wear of the plank.

With the 4½-ton drop-bottom cars used at this mine the slate-disposal cost from the cars is almost nil. The dump hopper is on the main-line track close to the coal headhouse. Thus the slate cars need not be switched out from the trips. Moreover, the mountainside below the foot of the cliff provides space for dumping for 15 to 20 years without any handling.



Should a man fall into the pit his weight is not sufficent to swing the gates outward. Rock swings them out, then slides down the steel chute and plunges over a 150-ft. cliff.

Axle-Cap Bolts Stay Put



THE PROBLEM of tightening locomotive axle caps in cramped quarters and keeping them from working loose has been simply solved by H. E. Rawlins, chief electrician of the Sahara Coal Co., Harrisburg, Ill. A new type of bolt having a jackscrew head has been substituted for all bolts requiring a wrench for tightening. The holes in the jackscrew head permit use of a steel bar to draw the bolt up tight. The steel bar is more readily employed in the tight quarters available and also does not slip off the head as a wrench will. Lock washers may be used to keep the bolt from working loose or the heads wired together with ⅛-in. rod.

Three jackscrew-head bolts are shown in place. Lock washers are employed to keep them from working loose. An entire bolt showing the threads and jackscrew head is displayed on top the grease reservoir cover.

Fixed!

Fixing a case of trouble is like removing another sprag from a standing trip—it's easier to get things rolling again. To fix a thing and make it stay fixed can be the source of a good operating idea. That's why we keep insisting that you submit your mechanical, electrical, operating or safety ideas. If accepted, Coal Age, upon publication, will pay you $5 or more for each.

Coal Economy ...is achieved through the use of SPECIFIC GRADES



Crucible Fuel Division, Crucible Steel Company of America, Crucible, Pennsylvania, uses two 48" **R & S** Hydro-Separators, two 7' and one 20' **R & S** Hydrotators to produce processed coal for metallurgical use at the rate of 400 tons per hour.

Run-of-mine capacity is 500 tons per hour. Raw coal screen-sizing, hand picking and crushing of the plus 4" material proceeds at this rate until 4" material is stored in a 2000 ton concrete bin. Further sizing to 4" x 1" and 1" x 3/8" for the coarse coal washing in **R & S** Hydro-Separators and 3/8" x 0" for the finecoal washing in **R & S** Hydrotators, is at the rate of 400 tons per hour. The blended and washed coal is reassembled for shipment in river barges or in railroad cars.

WISE COAL CONSUMERS

use the grade of coal particularly adapted to their specific requirements—

SMART PRODUCERS

clean and grade their coal to fit the specific requirements of their customers—or for their own use.

R & S HYDRO-SEPARATORS

Hydrotators—and Stump Air Flow cleaners are designed for better processing to meet these consumer demands. R & S descriptive bulletins should help you. We will be glad to send them to you upon request. Bulletin No. 161—R & S Tandem Hydro Separator; Bulletin No. 162—R & S Hydrotator; Bulletin No. 163—R & S Stump Air-Flow Cleaner.

RS AND COMPANY

ROBERTS and SCHAEFER CO.

307 North Michigan Avenue, Chicago 1

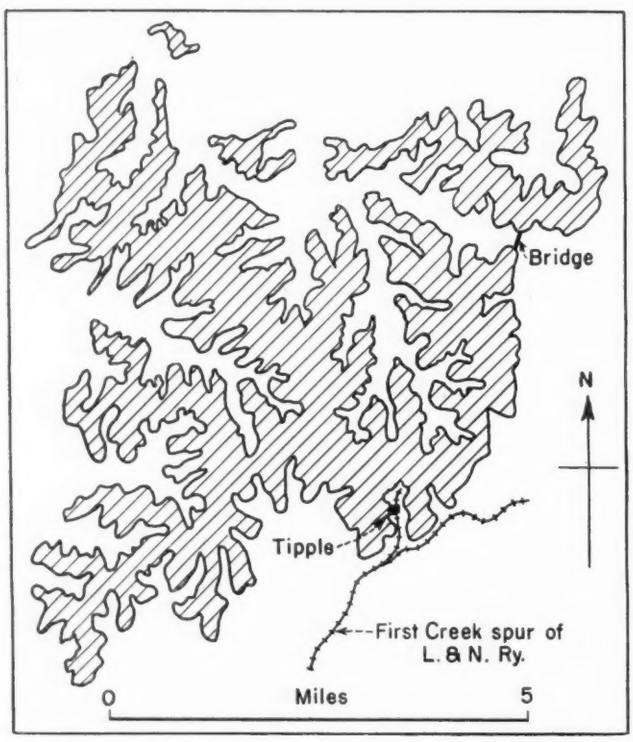
P. O. Box 865
PITTSBURGH, PA.

P. O. Box 570
HUNTINGTON, W. VA

High Bridge Promotes Economical Haulage



Mining is largely transportation. This Blue Diamond bridge, 1,000 ft. long and 225 ft. high, reflects the stress laid on economical haulage.



WHERE AVAILABLE tonnages are large the Blue Diamond Coal Co., Knoxville, Tenn., headed by Alexander Bonnyman, president and principal engineer, and operating mines in Tennessee, Kentucky and Virginia, has followed with success a bold policy of making large expenditures for equipment to handle coal at the lowest cost consistent with minimum degradation.

One of these moves was the building of a high bridge to carry a main haulage track across a deep ravine between two coal areas at its 4,000-ton-per-day Blue Diamond No. 1 mine in Perry County, Kentucky. This bridge, 1,000 ft. long and 225 ft. high, taps an additional area which contained 10,000,000 tons when it was opened by completion of the bridge in 1940.

Mr. Bonnyman, an engineer who, prior to his connection with the coal company, built over 100 steel bridges for southern railroads, points with pride to this Blue Diamond bridge, which served so well during the war emergency and will continue to serve for many years to come.

The bridge is shown in an accompanying illustration. The loaded cars are 3½-ton drop-bottom units. Blue Diamond was one of the early producers to adopt this type. Track gage is 48 in.

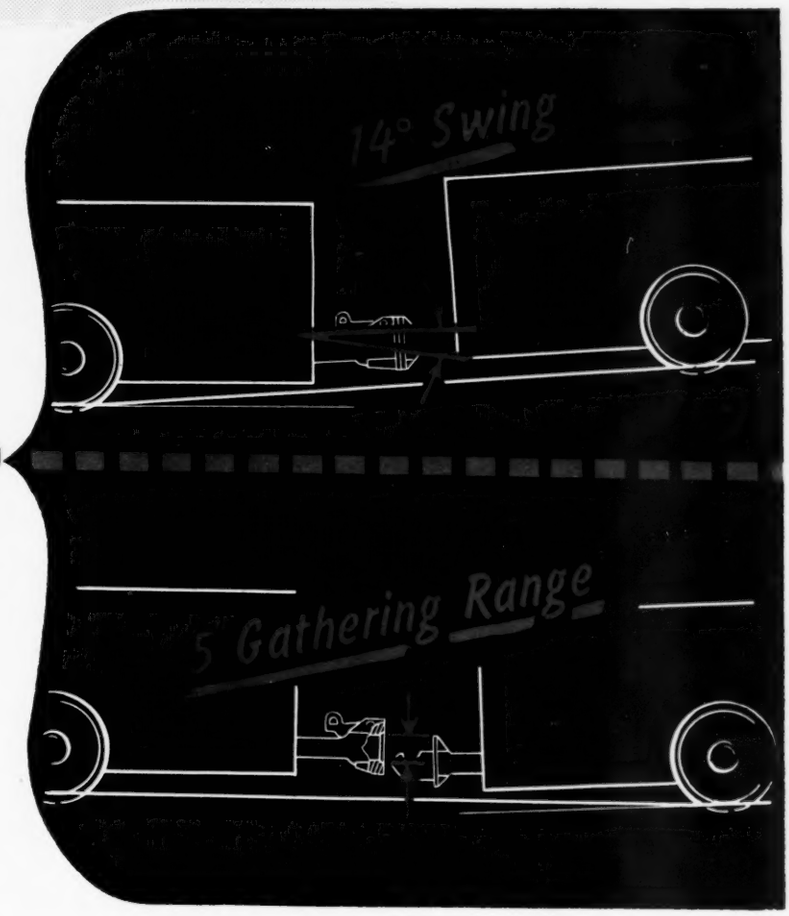
During each of the war years, Blue Diamond No. 1 mine shipped over 1,000,000 tons. To date the mine has shipped approximately 18,000,000 tons and will ship about 27,000,00 tons more. This mine, in the Blue Diamond seam, is on the North Fork of Kentucky River, about 3½ miles from the main Eastern Kentucky Division of the Louisville & Nashville R.R.

Coal areas total about 30 square miles at Blue Diamond No. 1 mine. The high bridge, four miles from the tipple, extended the main haulage to an area isolated by a deep valley and containing over 10,000,000 tons.

O-B Automatic Couplers

WILL OPERATE ON PITCHED GRADES, TOO!

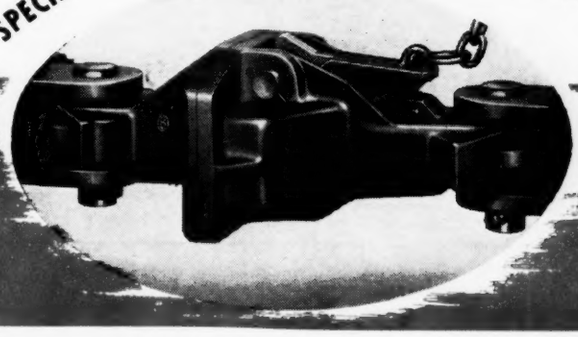
14° Vertical swing enables O-B Couplers to operate over sharp breaks in grade. All movement takes place in flexible rubber draft gear — the coupler faces remain locked to each other in center-to-center position.



5-inch vertical gathering range allows O-B Mine Car Couplers to join on wide range of track dips and knuckles. Cars couple together automatically upon impact — no manual alignment of the coupler heads is necessary.

2709-AM

SPECIFY O-B AUTOMATIC MINE CAR COUPLERS ➡ **Designed specifically to handle mine operating conditions.**



Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario

Ramps Facilitate Scraper-to-Conveyor Transfer

TWO DIFFERENT ramp installations for driving slopes in pitching coal with scrapers and chain conveyors have been worked out by Elkins Read, superintendent, Phoenix colliery, Phoenix Coal Co., Minersville, Pa. Both the slope driving and operation in chambers with conveyors are described in the article starting on p. 93 of this issue.

The two styles of ramps shown in the accompanying illustrations were designed for two conditions of conveyor installation. One is employed where the scraper discharges to the end of a gathering conveyor and consequently includes an opening through which the coal falls onto the conveyor from the scoop. The other is used where the scoop discharges to the side of a cross conveyor.

Both ramps are constructed of plank and timber and are mounted on cross timbers spiked to posts at the proper height. Both are equipped with stop blocks or planks to prevent the scraper being pulled through and into the conveyor. These stops also are spiked to the posts supporting the ramp.

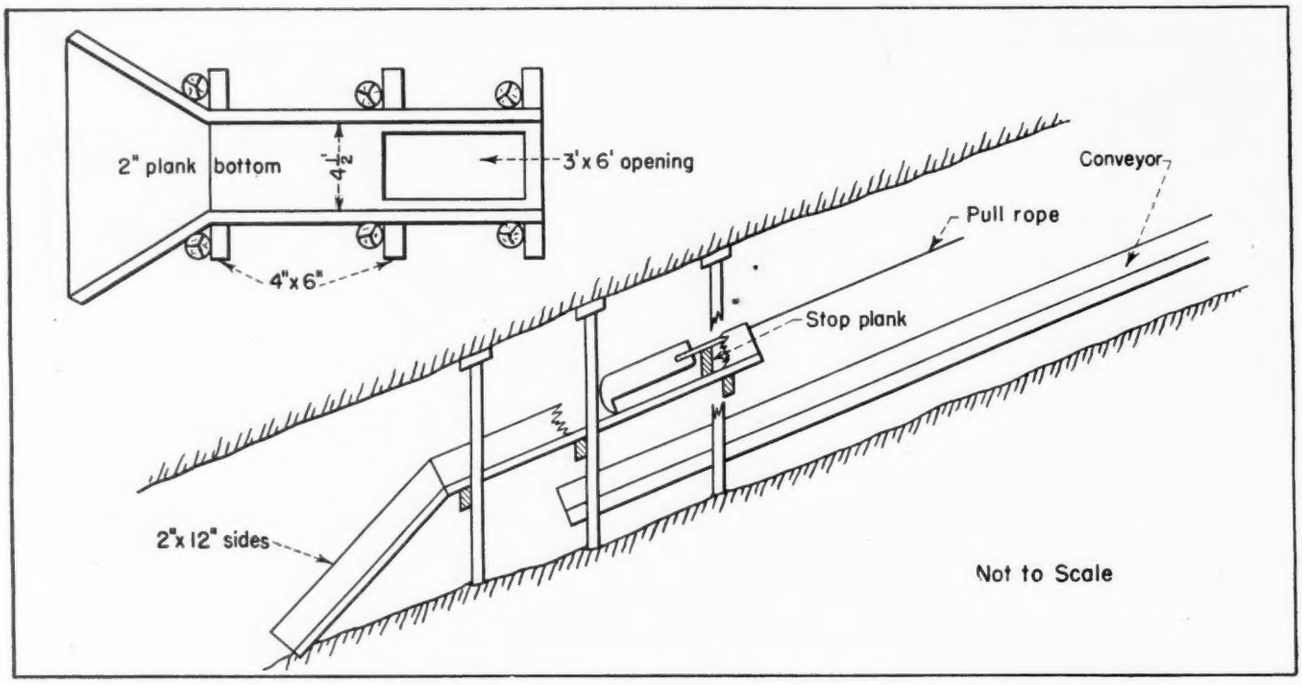


Fig. 1—This ramp, for end-on discharge to a gathering conveyor, includes a hole in the slide and stop plank.

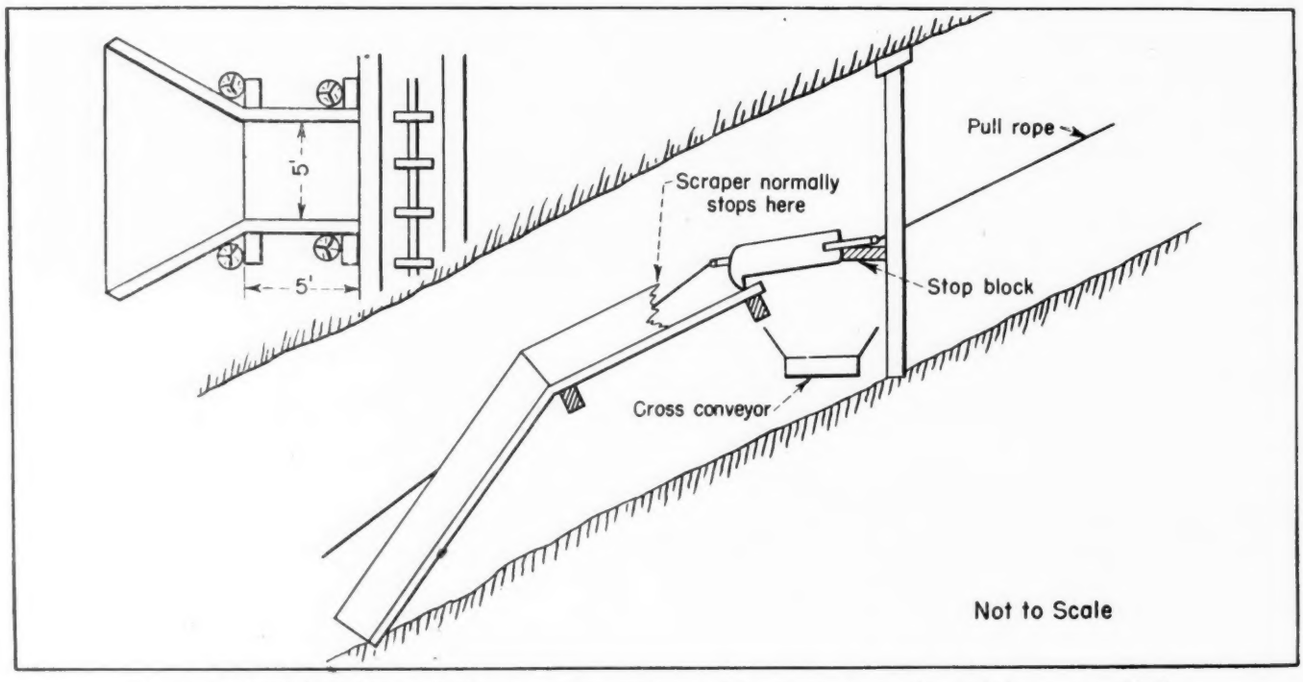


Fig. 2—Designed for sidewire transfer to a cross conveyor, this scraper ramp also includes a stop block.

RAYON
IN U.S. ROYALS!

The story of another achievement in making good tires great



1930
"U. S." BEGAN RAYON CORD RESEARCH

1937
"U. S." INTRODUCED FIRST RAYON TRUCK TIRE

1938
"U. S." INTRODUCED FIRST RAYON PASSENGER TIRE

1941
"U. S" FIRST TO GO 100% TO RAYON FOR AIRPLANE TIRES

1942-3-4-5
U. S. ROYAL RAYON SYNTHETIC TRUCK TIRES IMPROVED WARTIME COMMERCIAL TRUCK PERFORMANCE 375% OVER COTTON

1942-3-4-5
U. S. ROYAL RAYON TRUCK TIRES HELPED KEEP THE ARMY'S TRUCKS ROLLING

1944
"U. S." INTRODUCED NEW, STRONGER HEAVY DENIER RAYON CONSTRUCTION

1946
U.S. ROYAL FLEETWAY
100% RAYON
NOW BETTER THAN EVER!

U.S. TIRES

U. S. Royal Fleetway plus U. S. Fleet Service . . . the right combination for lower cost per tire mile. Phone your U. S. Truck Tire Distributor TODAY!

Listen to "Science Looks Forward"—new series of talks by the great scientists of America—on the Philharmonic-Symphony Program. CBS network, Sunday afternoon, 3:00 to 4:30 E.S.T.

UNITED STATES RUBBER COMPANY

1230 Avenue of the Americas, Rockefeller Center, New York 20, N. Y.

123

Fused Nip Box Promotes Safety

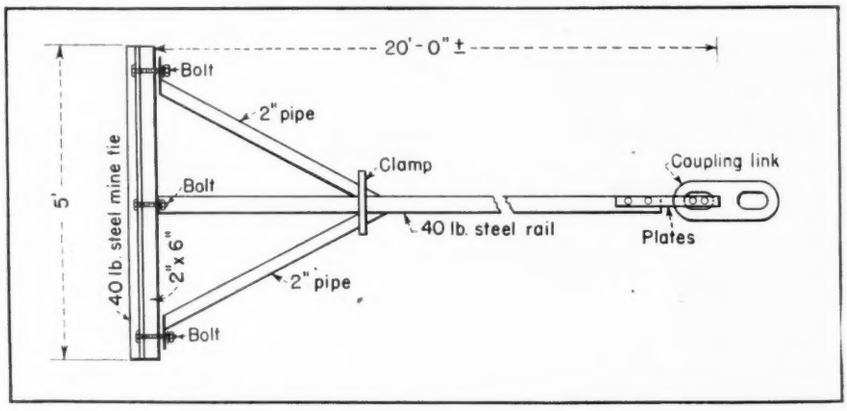


BETTER FUSE protection for trailing cables is provided by the safety fuse box shown in the accompanying illustration from the Hanna Coal News. The box was designed by John Sowers, general mine foreman, Dun Glen No. 11 mine, Hanna Coal Co., Dun Glen, Ohio. Transferring the fuses, used with all trailing cables at Hanna mines, to boxes located at the room necks, with permanent wiring from the trolley and feeder system, promotes safety by eliminating suspension of the cables over the haulage. Fusing also eliminates one of the major sources of fires.

Bob Fuller, Dun Glen helper, demonstrates the fused nip box.

Pusher Helps in Slate Disposal

TO FACILITATE slate disposal, the pusher shown in the accompanying illustration has been made up and is being used at the 3-C mine of the Amherst Coal Co., reports L. R. Hopkins, Amherstdale, W. Va. At this operation, gathering motors bringing coal to the outside place the cars on a sidetrack where one man does preliminary slate picking by removing pieces from the tops of the loads. Small pieces he can throw over the hill. Large pieces beyond his strength he slides off the car. At times when a motor is waiting for a trip of loads he couples to the pusher and shoves the large slate over the bank.



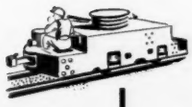
Details of pusher used with locomotive in slate disposal.

Wire Guard Protects Timberman



FOR USE where it is necessary to timber or do other work in headings where the trolley wire has been installed, August De Nardi, Piney Fork No. 1 mine, Hanna Coal Co., Piney Fork, Ohio, has developed the wire guard shown in the accompanying illustration. Its length is 3 ft. and it is made of plank and lined with rubber sheeting. After it is placed on the wire, wooden pins are passed through the two side members, keeping the guard on the wire while permitting it to turn clear over without falling off. Once on the wire, it can be slid along as desired between hangers.

August De Nardi poses with his wire guard.



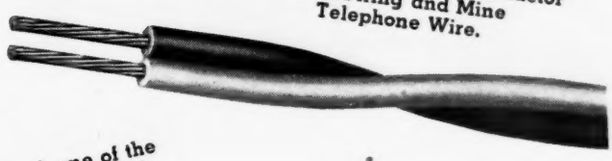
BUILT FOR MINE SERVICE

FOR today's and tomorrow's needs of the mining industry, Rome Cable produces wire and cables of long-proved dependability. Whether it be of thermoplastic or rubber, its construction is the result of sound engineering — lessons learned from actual service records of performance. Manufactured with the care that comes only with many years of experience and honest workmanship, Rome Cable products give the maximum in service.

Our line includes:

- Parallel Duplex Mining Cables
- Concentric Mining Cables
- Locomotive Gathering Cables
- Portable Drill Cords
- Portable Power Cables
- Control and Signal Cables
- Shot Firing Wire
- Mine Telephone Wire

Rome Synthinol* Two Conductor Shot Firing and Mine Telephone Wire.



Rome "60" Drill Cord, one of the many well-known Rome "60" Mining Machine products.



*Trademark Registered

Thermoplastic insulated Shot Firing and Mine Telephone Wire was pioneered by Rome Cable. Its imperviousness to acidulous mine waters, and its resistance to rough use make it a necessity. Its light weight and tensile strength make it a natural choice.

Rome "60" Drill Cord combines maximum flexibility of motion with unbeatable toughness. The Rome "60" jacket is flameproof. Like all Rome mining cables, it is built for tough service and has long proved its worth.



ROMEY SAYS:

"You can rely on Rome Cable Products to handle those tough jobs in the mine."

SALES OFFICES

NEW YORK 17, N.Y.
1163 Lincoln Bldg.
60 East 42nd Street

CHICAGO 6, ILL.
208 So. Jefferson Street

LOS ANGELES 12, CALIF.
340 Azusa Street

SAN FRANCISCO 3, CALIF.
1045 Bryant Street

CLEVELAND 14, OHIO
602 Society for Savings Bldg.
145 Public Square

PITTSBURGH 19, PA.
2537 Koppers Bldg.

WASHINGTON 5, D. C.
Room 801
1507 M Street, N.W.

BOSTON 10, MASS.
Chamber of Commerce Bldg.
80 Federal Street

PHILADELPHIA 7, PA.
1803 Liberty Trust Bldg.
Broad and Arch Streets

DETROIT 2, MICH.
547 New Center Bldg.

See Your Telephone Directory

FROM BAR TO FINISHED WIRE

ROME CABLE
CORPORATION
ROME • NEW YORK

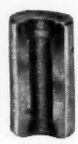


WHY

CINCINNATI CHAINS AND BITS OUT-PERFORM ALL OTHERS...



CINCINNATI DUPLEX CHAIN



Hardened Eccentric Pin puts joint wear between pin and insert . . . doesn't turn in block. With replacement of pin and insert the joint is like new.



Easily replaced, hardened alloy steel Connector Insert gives fresh from the factory joint accuracy to worn connector.



Alloy steel, heat treated Rivet holds bearing pin against longitudinal displacement. Easily removed.

- The Cincinnati Duplex Chain as well as the Cincinnati Standard Chain is engineered for a minimum of power consumption and a maximum life.
- Cincinnati Chains, made of the finest alloy steel, are engineered to place wear and tear on inexpensive easily replaceable parts.
- Cincinnati Chains because of superior design, engineering and metallurgical perfection require a minimum of servicing
- The Cincinnati double-ended reversible Duplex Bit greatly reduces bit setting time. Duplex Bits are firmly locked into chain avoiding loss of bits and loss of time.
- Cincinnati Duplex Bit eliminates sharpening operations and out-cuts ordinary Mine Sharpened Bits from 2 to 6 times per point.

THE CINCINNATI MINE MACHINERY CO.

2983 SPRING GROVE AVE.
CINCINNATI, OHIO

News Round-Up



Lewis Closes Bituminous Mines April 1; Welfare Fund Stymies Negotiations

FOLLOWING three weeks of fruitless negotiations marked by union insistence on a welfare fund to be supported by operator contributions, the bituminous coal mines of the country were closed April 1, when John L. Lewis terminated the existing national agreement. The closing followed operator offers on March 25 of wage and other adjustments as follows:

1. To increase the day and tonnage rates of miners to meet the requirements of the government's wage-price policy and the generally accepted wage increase patterns already worked out in other large national industries such as steel, oil and automotive.

"2. To create a joint exploration and consideration of a plan to create by joint contribution a reasonable fund to be used to mitigate unusual hardships arising directly from accidents occurring in the course of employment in the mines, such a fund to be administered by some independent agency (such as the Red Cross) with the advice of the mine workers and the operators.

"3. To turn over to designated agents of the mine workers' union all funds collected from mine workers for payment of doctors, hospitals, burial funds, benefit funds and for any similar purposes, where the union's locals are dissatisfied with existing arrangements.

"4. To provide that all operators parties to the contract will accept the provisions of the workmen's compensation laws of any states wherein such acceptance is optional.

"5. The creation of a committee in each coal-producing State, composed of three miners and three operators, to study the mining laws of the State and to suggest to the operators and mine workers such amendments to existing statutes as they consider necessary to further safety, to the end that by their united effort the highest degree of safety that is possible may be attained. In addition that a committee composed in equal numbers of operators and miners be established in each of the operating groups represented in the conference to serve in an advisory capacity to the several State committees.

"6. To further guarantee of contract compliances, that in addition to the penalties imposed on individual mine workers under existing district agreements, liquidated damages at the rate of $1.00 a man per day shall be paid by the union to the operators affected for each day of strike in violation of contract. In addition to penalties imposed on the operator under existing district agreements, liquidated damages at the rate of $1.00 a man per day shall be paid by the operator to the union affected for each day a lockout continues."

Operator Proposals Rejected

These proposals were rejected by Lewis, who insisted that operators accept his demands for a welfare fund and a contract clause obligating them to live up to all recommendations of the federal mine inspectors before he would consent to discuss wages and hours and other questions.

The government entered the picture several days before the stoppage, one of its actions being the appointment by Secretary of Labor Schwellenbach of Paul Fuller as his official conciliator to meet with both sides. On March 28 J. A. Krug, as Solid Fuels Administrator, in an effort to conserve existing supplies of coal, issued orders for coal to be held at the mines and for limitation of retail deliveries to certain consumers.

In opening the conference on March 12, John L. Lewis featured a complete change of pace compared with previous negotiations, and listed the nine demands of the miners in the most general terms possible. Terming them "negotiable suggestions," he obviously sought to put the next step up to the operators. Some observers saw in this strategy a move aimed at the C.I.O.—an A.F.L. advantage if the miners are able to secure substantial gains without a prolonged strike—but in any case it left the operators in the dark as to what demands would be pressed.

The first four days of the open sessions were spent by Mr. Lewis and other union heads in a detailed recital of both local and national grievances in support of the demands for a health and welfare fund and improvement of safety practices. At one point, accusing the union of "endless repetition" and "filibustering," Charles O'Neill, chairman of the operators' negotiating committee, urged that the conference stop wasting time and consider specific changes in the contract. To this, Mr. Lewis retorted that if the operators "don't want to stay here, they can leave."

Highlights of the arguments for the royalty fund and improved safety practices were the two statements made by Mr. Lewis that the operators "have made dead 28,000 miners in the last 14 years through cupidity,



Press Association Inc.

Conferring as the national bituminous wage conference opened in Washington on March 12 are, left to right: Ezra Van Horn, Cleveland, chairman of the operators' negotiating committee; Thomas Kennedy, secretary-treasurer of the United Mine Workers; John L. Lewis, president of the U.M.W.; and Charles O'Neill, in charge of negotiations for the operators.

stupidity and wanton neglect, and have injured 1,004,000 more," and that the "industry extorts annually from the pay envelopes of mine workers $60,000,000 for pseudo, hypothetical and substandard medical service, hospitalization and insurance of an actual value of less than one-third of the aforesaid $60,000,000." The miners, he declaimed, "demand abatement of this slaughter. . . . We demand cessation of this extortion."

On March 18 the operators seized their first chance to speak by charging that the welfare fund was no more than "a vast treasury to strengthen the union and build a social government within our public structure," and they protested vigorously against unionization of foremen and at the same time submitted four demands of their own: suitable guarantees against wildcat strikes and slow-downs in production; redefinition of qualifications for vacation pay; elimination of pay for lunch periods; and substitution of eight hours for seven hours a day and 40 hours for 35 hours a week as the point at which overtime begins. It was stated that the proposal for a revised work week did not contemplate reducing the pay that miners now receive for 40 hours.

In discussing wildcat strikes, Charles O'Neill, the operators' chairman, asserted that in the nine months from April 1 to Dec. 31, 1945, there were 3,939 illegal strikes, involving 817,761 men and resulting in losses of 5,282,958 man-days and 29,443,924 tons of production.

Harry M. Moses, president of H. C. Frick Coke Co., labeled the union's arguments on the welfare fund and safety issues a "deliberate attempt" to create "a false case." He stated that deaths in 14 years had totaled 14,615, and not the 28,000 cited by the union, and that injuries amounted to 676,591 and not 1,004,000. The industry's improving safety record was pointed out, and the union was accused of carefully picking the 14 years on which its figures were based, rather than taking a period immediately preceding the present. Mr. Moses said that analysis of the figures indicated that $14,320,800 yearly was being deducted by operators for hospitalization, medical funds and burial insurance, and not $60,000,000, as alleged by the union.

At the last open meeting, on the morning of March 19, Mr. Lewis, in summing up for the miners, indicated that he considered the welfare fund and adherence to safety regulations to be the main pillars of a new contract. He asked operators to write in the following provisions: "The contracting parties realize that the loss of life in the coal mines and the ratio of injuries is too great to be condoned in any civilized country and the operators agree that henceforth they will meticulously carry out and put into effect every safety recommendation made by the inspectors of the U. S. Bureau of Mines." This and a welfare royalty were the only two "demands," he said. Everything else was only "suggestion." Stressing the importance of these demands to the miners, Mr. Lewis shouted, "What do you want—peace, or do you want war?"

On the question of unionization of foremen, Mr. Lewis said, "No, we don't want to manage the mines. We want the operators to manage them much better than the job they are now doing." Nevertheless, unionization of foremen was regarded by observers as one of the most important stumbling blocks to a speedy settlement. In the same session Mr. Lewis proposed that the operators join with the union in having Dr. Gallup poll the public on whether the NLRB ruling should be accepted in the industry. Summing up the miners' position, Mr. Lewis made it abundantly clear that it made no difference to the union whether the industry produced one, two or three million tons less yearly, but that the union felt that the men remaining were entitled "to decent treatment and American living conditions, with a special reward for the character of their service."

The joint subcommittee, which began its closed sessions Tuesday afternoon, March 19, appeared to meet heavy going in developing specific details on the points to be negotiated. Efforts by the operators to obtain dollars-and-cents figures on the wage-increase and welfare-fund demands brought forth from Mr. Lewis only the advice, "make us an offer." The miners also insisted that the welfare-fund question be first settled before proceeding with the other "suggestions" to be considered.

"Negotiable Suggestions"

The following are the demands made by the union at the opening of the national bituminous wage conference on March 12:

1. **Creation of a health and welfare fund for mine workers.**
2. **Adjustment of controversy affecting supervisory, technical and clerical employees.**
3. **Increase of wages and reduction of working hours affecting all classifications of inside and outside employees.**
4. **Adjustment of vacation, holiday and severance compensation.**
5. **Improved safety and compliance with mining, compensation and occupational disease laws.**
6. **Adjustment of intra-district and inter-district differentials and local inequalities affecting classification and compensation.**
7. **Elimination of inequities and abuses of existing fining and penalty provisions of basic and collateral agreements.**
8. **Amendment of rules and practices to promote mutual accord, increased efficiency and elimination of the small tyrannies of management.**
9. **Adjustment of controversy incident to unilateral interpretation of existing agreement by operators.**

New SFAW Order Keeps Partial Reports

SFAW, in Order No. 32, issued March 12, announced revocation on April 1 of SFAW Regulation No. 27 (the basic order for control of bituminous-coal distribution), except for continuation of certain reporting requirements of Regulation No. 27 (with minor modifications) as provided for in the new SFAW Order No. 32.

Plans for liquidation of SFAW, of which Order No. 32 is a step, were put before the National Solid Fuels Advisory Council for War at a meeting with SFAW officials on Feb. 27, thought to be the final meeting of the council. All SFAW activities are to cease by June 30, according to Dan Wheeler, Deputy Solid Fuels Administrator, but all district boards have been asked to remain active through May.

•

Russia Resumes Mine Gasification

Moscow (by cable from McGraw-Hill World News Bureau)—A new research group—known as the Commission for Technical Sciences—has been created by the Russian Government to resume experiments in the underground gasification of coal, interrupted by the war. Burning coal underground was first advanced by the Russian scientist Mendeleyev more than 50 years ago and was advocated by Lenin, who believed underground gasification would revolutionize all industry.

Not until 1936, however, was any practical application made, at which time an underground gasification system was installed at Gorlovka, in the famous Donetz coal basin. Later, successful experiments were conducted in the Kuznetsk, Moscow and West Siberia coal basins. Just before the outbreak of war, Soviet engineers began the construction of two large coal-gasification stations at Lisichansk and Kurakhovo; in the Donbas. Both were seized by the Germans before completion.

There are a number of methods of underground gasification and, according to Soviet scientists, much has yet to be done in the improvement of this technique. At Gorlovska, coal was fired and air pumped underground, with gas and byproducts collected through pipes coming up to the surface at the other end of the seam. According to Russian engineers, 80 to 90 percent of the coal is utilized by this method—against 60 percent under usual mining methods.

The work of Kapitzas, of the Soviet Academy of Sciences, in obtaining inexpensive oxygen in liquid as well as gaseous form probably is indicative of the direction Russia may take in solving the problems of underground gasification of coal. Russian engineers also are reportedly hopeful of working out methods of underground gasification of combustible shales, of which the Soviet Union has vast deposits.

The new Commission for Technical Sciences, which will function as a special section of the Soviet Academy of Sciences, is headed by A. M. Terpigorev.



WHEN WE SAY "GENUINE"— WE MEAN "LONGER SERVICE"

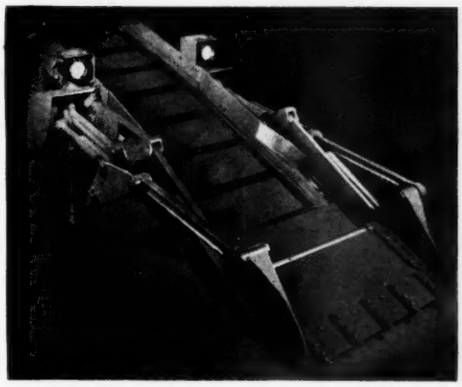
Genuine, means the "Real Thing". And when we suggest that you use genuine Whaley "Automat" replacements parts, we mean "Longer Service" parts.

You can understand, of course, that Myers-Whaley, more than anyone else, is interested in seeing to it that every Whaley "Automat" renders maximum satisfactory service, and at the least possible maintenance cost.

The "Automat" is our machine . . . our responsibility, and only genuine Myers-Whaley replacements parts insures complete "Automat" service. Keep your "Automats" all "Automats"—through and through, for best performance. Myers-Whaley Company, Knoxville 6, Tennessee.

Wm. Neill & Son, Ltd., St. Helen's Junction, Lancashire, England, are licensed for Sale in Great Britain and Europe.

Remember, the "Automat" will load —in its stride—any lump of coal that will pass through your tipple or any lump of rock your cars, aerial tram or larry can take.



MYERS-WHALEY

Mechanical Loaders Exclusively For Over 38 Years

Broad Producer-Dealer Marketing Plan Approved at National Coal Meeting

ACTION on broad strategy in the industry's campaign to capture the lion's share of the vast new market created by prospective housing construction and to retain present markets highlighted the meeting of the National Coal Association at the Cleveland Hotel in Cleveland, Ohio, March 14-15. The association adopted without dessenting vote an aggressive program for assistance to retail dealers in developing domestic outlets and upped tonnage assessments from 1 to 3 mills in support of the expanded program. Fred S. McConnell, president, Enos Coal Mining Co., Cleveland, Ohio, and president of N.C.A., called the first session to order March 14 and turned the gavel over to Crawford C. Madeira, vice president, Rockhill Coal Co., Philadelphia, Pa. E. H. Davis, president, New York Coal Co., Columbus, Ohio, presided over the next session, and L. E. Woods, president, Crystal Block Coal & Coke Co., Huntington, W. Va., was chairman at the concluding session, March 15.

Adoption of the sweeping marketing plan, formulated by the N.C.A. marketing committee after long study and presented by B. R. Gebhart, chairman, and vice president, Chicago, Wilmington & Franklin Coal Co., Chicago, established four broad objectives:

1. Improvement and standardization of retail sale, delivery and servicing of solid fuel.

2. Promotion of the use of improved burning equipment and controls and provision for servicing of such equipment and the plants in which it is installed.

3. Improvement of public opinion of coal and the industry through retail coal merchants, whose service and advertising strongly affect the thinking of all fuel consumers, both domestic and industrial.

4. Retention of present business and promotion of additional business for domestic coal, particularly in the new home market.

Coal-Service Network

Taking the offensive in planning for the future, the association adopted a five-phase method for conducting the campaign hand-in-hand with the retailer:

1. Creation of a national network of community coal-service organizations and promotion of such organizations under sponsorship of N.C.A.

2. Operation of such organizations under the same name, if possible, to permit coordination of educational, advertising and promotional activities and permit eventual support by national advertising.

3. Establishment of a set of standards for operation of coal-service organizations flexible enough for adaptation to communities of all sizes in all sections of the country, but with certain basic standards or minimum requirements mandatory to warrant N.C.A. financial and other support. Standards are to cover the conduct of initial surveys to determine local competitive conditions and thus guide organization activities; specifications as to minimum proportion of participating retailer tonnage required for N.C.A. support; and details as to incorporation and management of such organizations. In addition, such standards are to include, among other things, the following:

A. Establishment and conduct of training courses for personnel covering public relations, personal and telephone selling, proper application of product to equipment, modern heating equipment and controls, deliveries, servicing and combustion.

B. Improvement of delivery equipment and practice to match cleanliness of competing fuels.

C. Establishment of central or cooperative service departments to handle trouble calls on a 24-hour basis; conduct of heating-plant analyses and giving advice on heating problems and selection and supply of heating equipment; provision for repair or replacement of equipment, furnace cleaning and janitor service for established fees to consumers when warranted; and, where possible, offer of 100 percent heat-service contract arrangements to match convenience of competing fuels.

D. Handling of community advertising and publicity.

4. In smaller communities where central training and service organizations are not feasible, if retailers are willing to subscribe and adhere to basic standards of delivery and cooperative or industrial servicing, extension of N.C.A. support through matching, within defined limits, the funds provided by participating retailers for local cooperative advertising of the better service behind control. It is estimated that a relatively large number of such communities will qualify for this type of cooperation.

5. Collection and supply of information and suggestions on central exhibits and central selling agencies for modern heating equipment and controls, on heat financing plans and on other constructive or promising activities. Equipment exhibits and agencies usually are financed principally by exhibitors. They provide logical headquarters for community organizations where service and other calls can be received. Establishment of such exhibits or agencies should not, however, be a requirement in the organization plans.

Long-Range Operation

To sell the coal-service organization idea to retailers and customers the association adopted two plans of action:

1. To present the program at meetings of operator and wholesale organizations, and of shipper salesmen, salesmen's clubs, etc., wherever these occur, and at meetings called for the purpose, where salesmen will be schooled in organization details and standards and equipped to assist with formation and conduct of organizations in their territories.

2. To outline the program to directors and secretaries of regional and State retailers' associations and, with their approval, at conventions and conferences. It will be necessary to enlist the active assistance particularly of State retail association officers in promoting formation of organizations within the areas over which their activities extend. Such support is expected to be readily forthcoming, for retailers, well organized to meet the necessities of the war years, are ready to shift attention from expiring government regulations to better merchandising if it promises to save their business.

Procedure for immediate and long-range operation of the program was outlined in six steps:

1. Selection and employment of two or three experienced merchandising men for the N.C.A. staff to work on detailing of



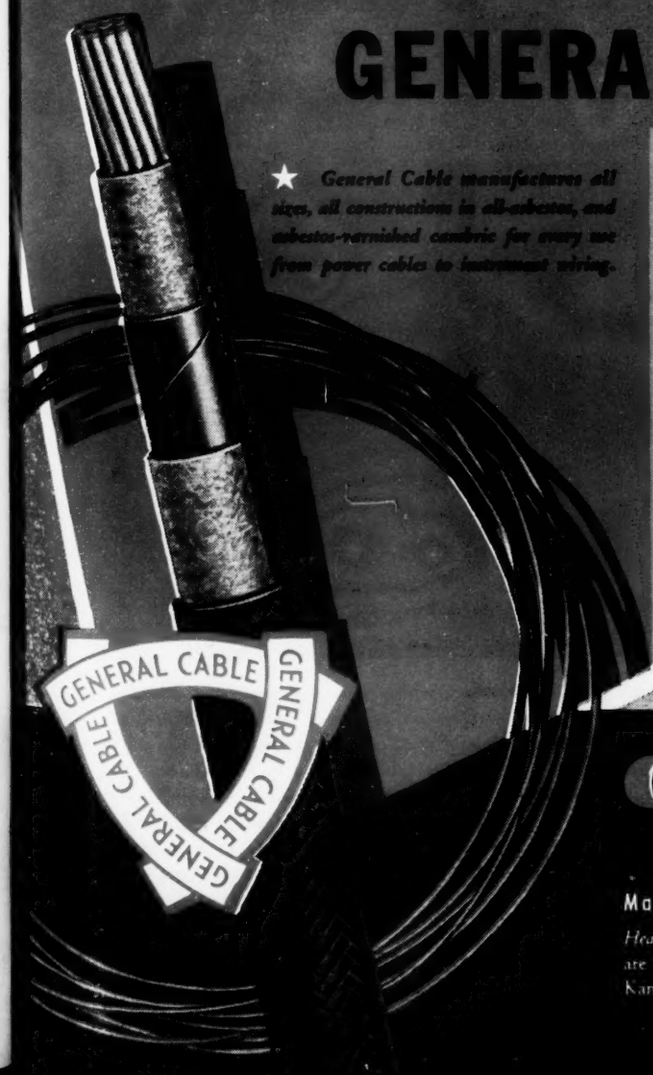
Speakers' table at the N.C.A. luncheon meeting, March 14. Left to right are R. H. Sherwood, president, Central Indiana Coal Co., Indianapolis, Ind.; J. D. Francis, president, Island Creek Coal Co., Huntington, W. Va.; Gen. Leonard P. Ayres, luncheon speaker and vice president, Cleveland Trust Co., Cleveland, Ohio; Fred S. McConnell, president, Enos Coal Mining Co., Cleveland, Ohio; E. C. Mahan, chairman of the board, Southern Coal & Coke Co., Knoxville, Tenn.; and John D. Battle, N.C.A. executive secretary, Washington, D. C.



Asbestos Insulated

WIRES AND CABLES OF GENERAL CABLE QUALITY

★ *General Cable manufactures all sizes, all constructions in all-asbestos, and asbestos-varnished cambric for every use from power cables to instrument wiring.*



Products of the same reliability which protected lives aboard the thousands of navy and merchant ships during the war. The Company's war-stimulated production capacity, with improved manufacturing techniques and experienced craftsmanship, makes General Cable your logical source of supply for all-Asbestos and Asbestos-VC Wire and Cable needs . . . Phone, write or telegraph the nearest General Cable office. Catalogs available for your advance information.

GENERAL CABLE
CORPORATION

Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose

Headquarters at 420 Lexington Avenue, New York 17, N.Y. General Cable Corporation Sales Offices are located at: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Kansas City, Los Angeles, New York, Philadelphia, Pittsburgh, Rome, N.Y., St. Louis, San Francisco, Seattle, Washington, D. C.

plans and standards and basic educational materials. These men will head up the program, operating under guidance and advice of the marketing committee, of which the senior of the group shall act as secretary. Later, additional field men may be required; these and the headquarters group to comprise the promotional staff.

2. Arrangement for collaboration between the marketing committee and duly constituted representatives of the retail branch of the industry in guiding the aforementioned work. These representatives should be invited to act with the marketing committee in all matters involving cooperation with retailers.

3. Launching the educational program already described among shipper salesmen and retailer organizations.

4. Publicizing the basic standards when completed, which cover clean deliveries of coal and provision of 24-hour emergency service. (With such service, consumers of coal may have the same feeling of security about their heating plants as they do about their electric lights.)

5. Undertaking to have retailers in as many communities as possible subscribe to and adhere to these basic standards; then arranging to match from the national fund provided, under carefully defined limits of amounts per ton, the money made available by retailer groups for publicity and advertising regarding the newly improved service for consumers of coal.

6. Moving into more elaborate features of the program, practical in larger communities, as rapidly as time, facilities and willingness of cooperating retailer groups will permit.

Competition to Be Met

Heeding the marketing committee's emphasis on the retail market as the source of 30 percent of the producers' income and as the industry's most fruitful source of good will, and looking toward the creation of a potential market for 30 to 40 million tons in new housing if competition from oil and natural gas can be met by efficiency, cleanliness, convenience and service, the association took positive action to share responsibility for education, advertising and meeting competition by adopting a 3-mill levy that will produce over half a million dollars more for support of the program and other expanded association activities in the next year. Through cooperative efforts of N.C.A. producers and local retailers, improved heating service with coal, extensive educational programs and improvements in service, equipment and merchandising methods are expected to develop.

The call for a high quality of industrial statesmanship, realization of the industry's opportunity and great obligation, and a spirit of pioneering was sounded by N.C.A. President Fred S. McConnell, who keynoted the opening session March 14.

Coal's competitive position relative to other fuels in the battle for old and new markets is being jeopardized by upward trends in the cost of coal, contended Donald R. G. Cowan, economic consultant of N.C.A. In an industry in which labor cost is so substantial a part of production cost, increases in wages cause a disproportionate increase in prices. Although mechanization has reduced labor per ton, the real labor cost has risen, for the industry has turned over to labor more than the advantages growing out of mechanization, Dr. Cowan stated. A six-point program to offset inroads of competing fuels was proposed by Dr. Cowan as follows:

1. The effect of increasing labor costs on coal prices, coal use and total employment in the mines should be put before the miners and the public.

2. There should be a reduction in coal prices. This should be brought about by working toward greater flexibility of producing and distributing costs in relation to volume of output.

3. Increased mechanization of the industry must take place, but the benefit must not go entirely to labor. Part of the benefit should go to management for making the improvements and to the public in lower prices to encourage coal consumption.

4. Every effort should be made to achieve economies in marketing with the definite aim of reducing the spread in prices between mine and market and hence reducing the price paid by consumers.

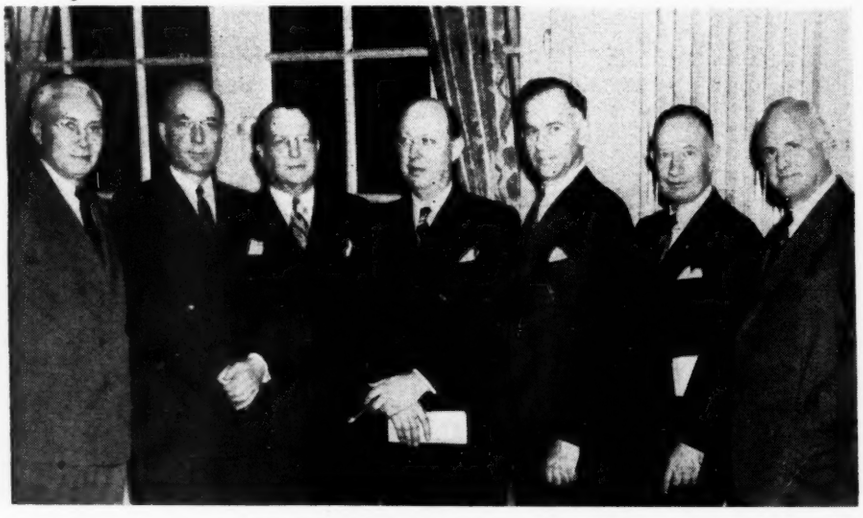
5. Surveys of changes and proposed changes in the use of different fuels by different industries should be made.

6. A definite educational program on coal merchandising in both domestic and industrial markets should be developed.

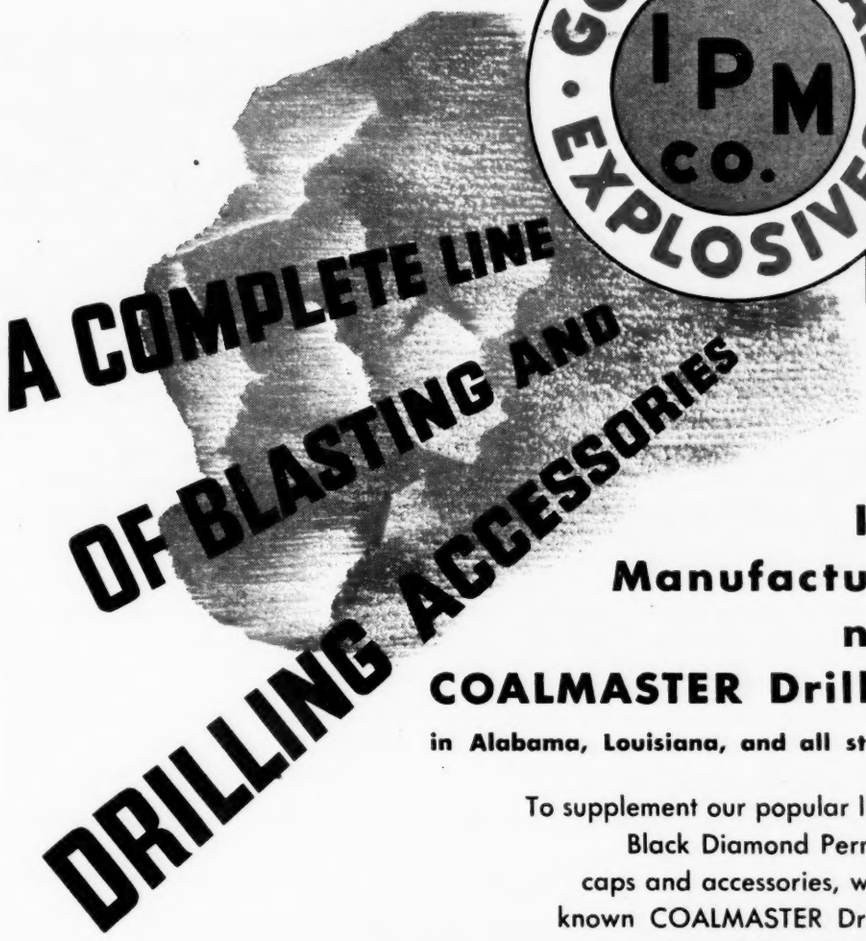
Research under way, both for residential and small industrial uses and for locomotive, industrial, chemical and mining uses, gives good promise that the industry can retain its present markets and capture new markets, declared H. J. Rose, B.C.R. director of research, who summarized progress to date. Emphasizing the urgency of the competitive situation in fuels for domestic use, the speaker pointed out that 47 percent of B.C.R.'s budget is allocated to research in the domestic field, covering residential-group heating projects, improved designs for coal-heated homes, automatic equipment and improved hand-fired installations for smokeless burning and ash handling. The remaining 53 percent is given over to projects related to steam locomotives, industrial power and heating, carbonization, gasification and chemical uses, coal mining and preparation and chemical and physical properties of coal.

Selling the Railroads

Standardization of Locomotive coal at higher levels of quality and modernization of coal-burning locomotives now in service are the soundest way to combat the threat of increasing diesel-powered railroading, pending thorough test reports on the new steam-turbine locomotive now under development, declared Earl C. Payne, consulting engineer, Consolidation Coal Co., New York, N. Y., who addressed the association on "Locomotive Fuel Competition." Citing a decrease of 38.4 percent in the number of in-service steam locomotives between 1920 and 1945, and a 10.4 percent loss in tractive effort for this same period, and pointing to an increase in diesel locomotives in use from none in 1920 to over 3,000 at the end of 1944, with 12.2 percent of the total tractive effort of all steam locomotives owned by railroads now taken over by diesels, Mr. Payne warned that the coal industry should no longer "bury its head in the sand and continue to believe that interdependence of the railroads and our industry can be relied on to perpetuate the use of coal as a locomotive fuel. The combination of poor or unsuitable



Marketing committee of the National Coal Association, whose plan for increasing producer-retailer cooperation in exploiting old and new markets for coal was adopted unanimously at the N.C.A. meeting at the Cleveland Hotel, Cleveland, Ohio, March 14–15: left to right, M. L. Patton, vice president, Truax-Traer Coal Co., Cincinnati, Ohio; B. R. Gebhart, vice president, Chicago, Wilmington & Franklin Coal Co., Chicago; H. A. Glover, vice president, Island Creek Coal Sales Co., Huntington, W. Va.; Murrell Crump, advertising manager, Sinclair Coal Co., Kansas City, Mo.; Earl C. Robertson, vice president, Pittsburgh Coal Co., Pittsburgh, Pa.; E. H. Zimmerman, sales manager, Imperial Coal Corp., New York City; Harold D. Wright, president, Republic Coal & Coke Co., Chicago. A. H. Collins, vice president, Pocahontas Fuel Co., New York, was not present when the picture was taken.



A COMPLETE LINE OF BLASTING AND DRILLING ACCESSORIES

GOLD MEDAL EXPLOSIVES · IPM CO.

DRILLING COALMASTER TOOLS

Illinois Powder Manufacturing Company now distributes COALMASTER Drilling Equipment

in Alabama, Louisiana, and all states west of the Mississippi

To supplement our popular line of Gold Medal Explosives, Black Diamond Permissibles, safety fuse, blasting caps and accessories, we have added the nationally-known COALMASTER Drilling Tools manufactured by Central Mine Equipment Company of St. Louis.

Strategically located stocks* will assure quicker deliveries and more helpful service on your drilling problems through the expert technical cooperation of our district representative. He will soon call to show you how COALMASTER Tools can help increase your drilling efficiency.

***COALMASTER DRILLING TOOLS *will be* STOCKED AT:**

BIRMINGHAM, ALABAMA
LITTLE ROCK, ARKANSAS
DENVER, COLORADO
PITTSBURG, KANSAS
HUNTSVILLE, MISSOURI
ST. LOUIS, MISSOURI
BUTTE, MONTANA
TULSA, OKLAHOMA
SALT LAKE CITY, UTAH
CASPER, WYOMING



ILLINOIS POWDER
Manufacturing Company

730 Pierce Bldg. • 304 Continental Oil Bldg. • 610 Walker Bank Bldg.
SAINT LOUIS DENVER SALT LAKE CITY

coal and obsolescent engines provides a ready market for new motive power burning competitive fuels."

A 25-year loss of 10 million tons in coal used by railroads between 1920 and 1945 further emphasizes the diesel threat to steam power in railroading, said Mr. Payne. The speaker urged producers to participate in the locomotive research program through Bituminous Coal Research and in the research activities of the railroads themselves covering combustion, drafting, air distribution, smoke and cinder loss, stokers, pulverizers, conveyors and grates, and to raise the quality of railroad coal by establishing Regional Locomotive Fuel Standards recognized by railroads and producers as best for locomotive use. Cooperative theme advertising by the industry and the railroads was suggested as a further step in reducing the threat of diesel competition.

"Bituminous coal ought to set for itself the goal of having more than 55 percent of American homes heated by coal," said General Leonard P. Ayers, vice president, Cleveland Trust Co., at the luncheon March 14. A brisk building boom for the next ten years, with the construction of about 12.5 million new homes, was forecast by General Ayres, who challenged the industry to meet competition with other fuels by engineering, research, and economic and promotional activities such as are now being undertaken by producers and operators.

"The coal industry has reached the crossroads," said H. A. Glover, vice president, Island Creek Coal Sales Co., Huntington, W. Va., who discussed the thinking behind the marketing plan presented by Mr. Gebhart and outlined earlier in this report. "We must decide now whether we shall sit idly by and watch our business go to competing fuels at a ruinous rate or whether we will organize with all of our natural allies and do everything in our power to maintain our position, whether we will accelerate our efforts to provide and distribute better burning equipment, whether we will join with our retailers in an effort to improve our service to the householder, whether we shall join with them in improving the merchandising of coal, whether we shall join them in attempting to get our fair share of the fuel business of the millions of new homes that will be constructed in the next few years and whether we shall devise new and effective competitive services to match the convenience and satisfaction of oil and gas, not only in existing homes of the better type but in the new ones that will be constructed."

Quoting figures to emphasize marketing opportunities in small homes, Mr. Glover pointed to 23,323,000 dwelling units that used coal, coke or wood in 1940 and should constitute today's market for coal or coke. Construction of 2,700,000 low-cost homes in the next two years by or for families with incomes of less than $5,000 per year, who comprise 91.2 percent of our population, will create a market for between 30 and 40 million tons of coal. An aggressive sales plan can capture this new market for coal, Mr. Glover declared, citing plans for a Twin Cities subdivision of 250 new homes, designed to sell at $6,250 each, every one of which will be equipped to burn coal because the alert managing director of Better Home Heating, Inc., went right after the business.

Following presentation of the marketing plan by Mr. Gebhart, 100 percent support was voiced by Calvin Holmes, president, Holmes-Dart Coal Corp., Knoxville, Tenn.; O. L. Alexander, president, Pocahontas Fuel Co., New York; H. C. Woods, vice president, Sahara Coal Co., Chicago; R. E. Jamison, vice president, Jamison Coal & Coke Co., Greensburg, Pa.; E. H. Davis, president, New York Coal Co., Columbus, Ohio; R. H. Sherwood, president, Central Indiana Coal Co., Indianapolis, Ind.; G. H. Love, president, Pittsburgh-Consolidation Coal Co., Pittsburgh, Pa.; R. L. Ireland Jr., president, Hanna Coal Co., Cleveland, Ohio; J. D. Francis, president, Island Creek Coal Co., Huntington, W. Va.; G. B. Harrington, president, Chicago, Wilmington & Franklin Coal Co., Chicago; G. W. Reed, vice president, Peabody Coal Co., Chicago; E. M. Douthat, vice president, Sinclair Coal Co., Kansas City, Mo.; Andy Murphy, editor, *Black Diamond*, Chicago; and C. R. Griffith, president, Southern Coal & Coke Co., Knoxville, Tenn.

Activities of N.C.A., work of committees on taxation, traffic, public relations, legal problems, engineering, government relations, and problems growing out of increasing federal encroachments upon private enterprise and the police powers of the states through the Wage and Hour Law, NLRB, social security regulations and federal mine inspection requirements were summarized in the report of John D. Battle, executive secretary. Further discussion of taxation and the Wage and Hour Law was provided by J. W. Haley, N.C.A. legal counsel.

Reporting a better trend in the public estimate of the coal industry because of the work of Bituminous Coal Institute, R. E. Jamison, who spoke at the concluding session as chairman of the policy committee of the Bituminous Coal Institute, called for added support for an expanded program of public education to be integrated with the new marketing program, the research program and the smoke-abatement program.

A resolution voicing the association's opposition to entry of the Federal Government, directly or indirectly, into the generation and sale of hydro-electric power in competition with privately owned power facilities and the displacement of steam-generated power with water power produced by government subsidy was adopted unanimously at the closing session.

INDUSTRY LEADERS

All officers were reelected at the meeting of the board of directors of the National Coal Association in Cleveland, Ohio, March 14–15, as follows:

President—Fred S. McConnell, president, Enos Coal Mining Co., Cleveland, Ohio.

Vice presidents—L. Ebersole Gaines, president, New River Co., Mt. Hope, W. Va.; Charles A. Owen, president, Imperial Coal Corp., New York City; K. A. Spencer, president, Pittsburg & Midway Coal Mining Co., Kansas City, Mo.

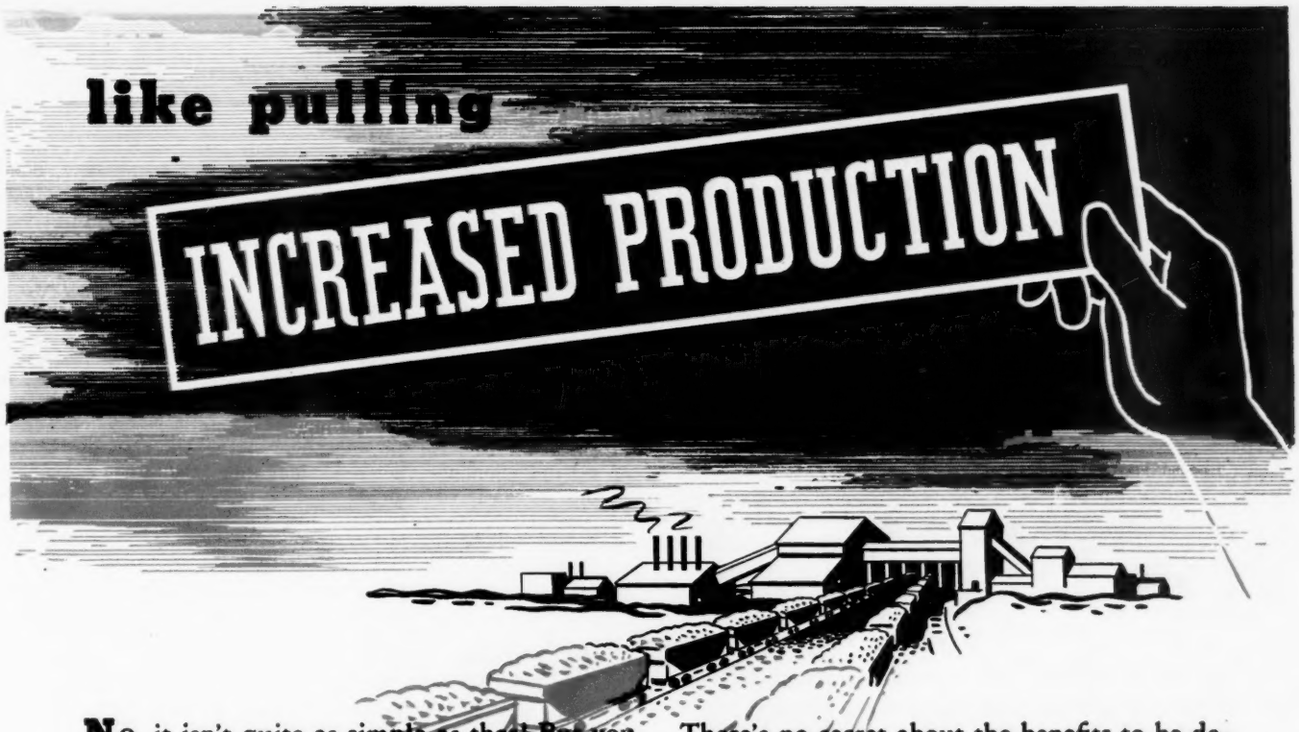
Treasurer—Ralph H. Knode, president, Stonega Coke & Coal Co.

Executive Secretary—J. D. Battle, Washington, D. C.

Assistant Secretary-Treasurer — C. C. Crowe, Washington, D. C.

Directors for the coming year were chosen as follows, new members of the board being indicated by asterisks (*):

***S. Austin Caperton, Slab Fork Coal Co.**
***G. Dawson Coleman, Ebensburg Coal Co.**
L. Ebersole Gaines, New River Co.
R. H. Knode, Stonega Coke & Coal Co.
George H. Love, Pittsburgh-Consolidation Coal Co.
E. C. Mahan, Southern Coal & Coke Co.
J. B. Morrow, Pittsburgh Coal Co.
***D. H. Morton, Winifrede Collieries Co.**
Charles O'Neill, United Eastern Coal Sales Corp.
Charles A. Owen, Imperial Coal Corp.
Henry G. Schmidt, Powhatan Mining Co.
Laurence A. Tierney Jr., Eastern Coal Corp.
Henry C. Woods, Sahara Coal Co.
L. E. Woods, Crystal Block Coal & Coke Co.
C. C. Dickinson, Dickinson Fuel Co.
W. L. Affelder, Hillman Coal & Coke Co.
O. L. Alexander, Pocahontas Fuel Co.
S. Harvey Blount, Central Service Co.
L. C. Campbell, Koppers Coal Division.
A. B. Crichton, Johnstown Coal & Coke Co.
E. H. Davis, New York Coal Co.
J. D. Francis, Island Creek Coal Co.
***H. Vernon Fritchman, Rochester & Pittsburgh Coal Co.**
George B. Harrington, Chicago, Wilmington & Franklin Coal Co.
Calvin Holmes, Holmes-Darst Coal Corp.
R. L. Ireland Jr., Hanna Coal Co.
R. E. Jamison, Jamison Coal & Coke Co.
W. J. Jenkins, Consolidated Coal Co.
***John L. Kemmerer Jr., Wise Coal & Coke Co.**
George J. Leahy, Little Betty Mining Corp.
Hooper Love, West Kentucky Coal Co.
Crawford C. Madeira, Rockhill Coal Co.
Fred S. McConnell, Enos Coal Mining Co.
Douglas Millard, Colorado Fuel & Iron Corp.
D. H. Pape, Sheridan-Wyoming Coal Co.
George W. Reed, Peabody Coal Co.
***R. A. Ritchie, Hutchinson Coal Co.**
W. C. Shank, Crowe Coal Co.
***Paul L. Shields, United States Fuel Co.**
R. E. Snoberger, Binkley Coal Co.
K. A. Spencer, Pittsburg & Midway Coal Mining Co.
Grant Stauffer, Sinclair Coal Co.
***R. L. Stearns, Steams Coal & Lumber Co.**
***D. A. Thomas, Boothton Coal Mining Co.**



No, it isn't quite as simple as that! But you *can* "use air" to increase production in your mine . . . pure, fresh air, efficiently circulated throughout your mine by La-Del Axial Flow Fans. Effective ventilation creates better working conditions by eliminating noxious fumes and smoke, especially in confined quarters where foul air is most prevalent.

There's no secret about the benefits to be derived from safer, improved working conditions. Increased efficiency is only natural when men work in safe, well-ventilated mines. Let La-Del engineers analyze your mine ventilation problems and prove to you that a La-Del Axial Flow Fan will not only *increase production,* but *lower operating costs as well.*



La-Del Troller 8 foot diameter, high pressure mine ventilation fan, attached to shaft.

LA-DEL
MINING EQUIPMENT

Belt Conveyors

Shaker Conveyors • Chain Conveyors

Elevating Heads

Pit Car Loaders • Mobile Loading Machines

La-Del Troller Mine Ventilating Fans and Blowers

And La-Del Experienced Engineering Counsel . . . Before and After Installation.

MATERIAL HANDLING LA-DEL MINE VENTILATION

LA-DEL Division
JOY MANUFACTURING CO.

New Philadelphia, Ohio

COMPLETE LINE OF UNDERGROUND CONVEYORS FOR LOW COST OPERATION

U.S. and European Mining Advances Highlight A.I.M.E. Coal Program

THE FIRST TIME away from New York in 34 years, the annual and 163d meeting of the American Institute of Mining and Metallurgical Engineers took place in Chicago, Feb. 25 through 28. At the annual banquet, Louis Shattuck Cates, president, Phelps Dodge Corp., was inducted as president for 1946. At the Coal Divison dinner, Henry F. Hebley, director of research for Pittsburgh Coal Co., was chosen division chairman for the coming year.

Coal Division activities included a six-session technical program highlighted by a symposium of recent overseas coal investigations in Germany and liberated European countries. Two days were concerned with coal-mine operations including detailed reports on utilization, maintenance and ventilation, mining methods and a general session. Presiding chairman were: Carl T. Hayden, vice president, Sahara Coal Co.; J. C. Tobey, managing director, Fairmont Coal Bureau; C. M. Smith, editor, *Mechanization*; D. L. McElroy, chief engineer, Consolidation Coal Co.; H. C. Rose, production manager, Pittsburgh Coal Co.; Dr. A. C. Fieldner, chief, fuels and explosives service, U. S. Bureau of Mines; and J. D. Dougherty, synthetic liquid fuels division, U. S. Bureau of Mines.

"The Importance and Value of the Coal Inspector," by Elmer Wierhake, Smokeless Fuel Co., read by R. C. Rasmussen, Bell & Zoller Coal Co., opened the Coal Division meeting. The growing importance of the inspector in satisfying a more demanding market and the fact that he must have a general knowledge of all phases of mining to execute his duties most efficiently was pointed out. Eugene McAuliffe, chairman of the board, Union Pacific Coal Co., added that transportation and handling will affect impurities and also that proper inspection during loading cars of prepared coal for shipment may increase the average load by 4 tons with no undue spillage. The session chairman, Mr. Hayden, mentioned that every sales complaint received by his company is investigated by the mine operating department.

"Post-War Prospects for Coal," by Dr. R. M. Weidenhammer, U. S. Department of Commerce, presented an encouraging picture for the next several years. The St. Lawrence waterway, pipelines for oil and gas, and atomic energy present threats to the coal markets. However, atomic energy for private use probably will be prohibited by the UNO. The conclusion from analysis of the various markets was that the industry should concentrate on the retail market because it gives 30 to 35 percent of the net profit of the coal industry. On a price basis the retail field is best for meeting competition because the cost of mining, transportation, etc., does not decrease much percentagewise. It was estimated that in the other markets (utilities, railways, industry, etc.), there is the necessary know-how so that coal will get its share of the business. The labor cost for coal was about 66 percent compared to 17 percent for oil. Also, the fact that the coal industry has only 5 percent of the working capital available to the oil industry makes a lot of difference in the money available for research by the two industries. Research, of course, is a very important factor in the future of the coal industry.

Experience over several years in sampling at Colorado Fuel & Iron Corp. was analyzed by W. M. Bertholf, who presented "Notes on Coal Sampling With Special Emphasis on What Makes a Sample Ample." He determined that large samples were unnecessary if the gross sample was well mixed. Graphs, charts and data showed that a 25-lb. sample of "A" coal was satisfactory and that 95 percent of all samples of "B" coal were within 0.5 percent of true ash content.



Henry F. Hebley
New Coal Division chairman

Past A.I.M.E. president Howard N. Eavenson, consulting mining engineer, analyzed "Wasting a Valuable Resource." He pointed out how coal was wasted by leaving top and bottom coal and not mining pillars at some properties. He asked if a government bonus for better extraction might be the answer. A discussion prepared by Mr. McAuliffe and read by Dr. L. E. Young, consulting engineer, deplored any thought along the lines of government control. He disagreed that the use of machinery resulted in lower extraction, pointing out that in Wyoming, they were getting a higher percentage through the use of machinery. It was his belief that the problem should be solved within the industry. Dr. Young added that it would be a tremendous job to establish a bonus and would require a corps of engineers, accountants, etc., and would give the government the power of life and death over a company; also that selective mining is a necessity in some seams and from a safety standpoint means conservation of human life in many cases. Some of the problems encountered by our agricultural program and also the British control of mines are examples of the tremendous job. He suggested that a committee be appointed to study the subject fully.

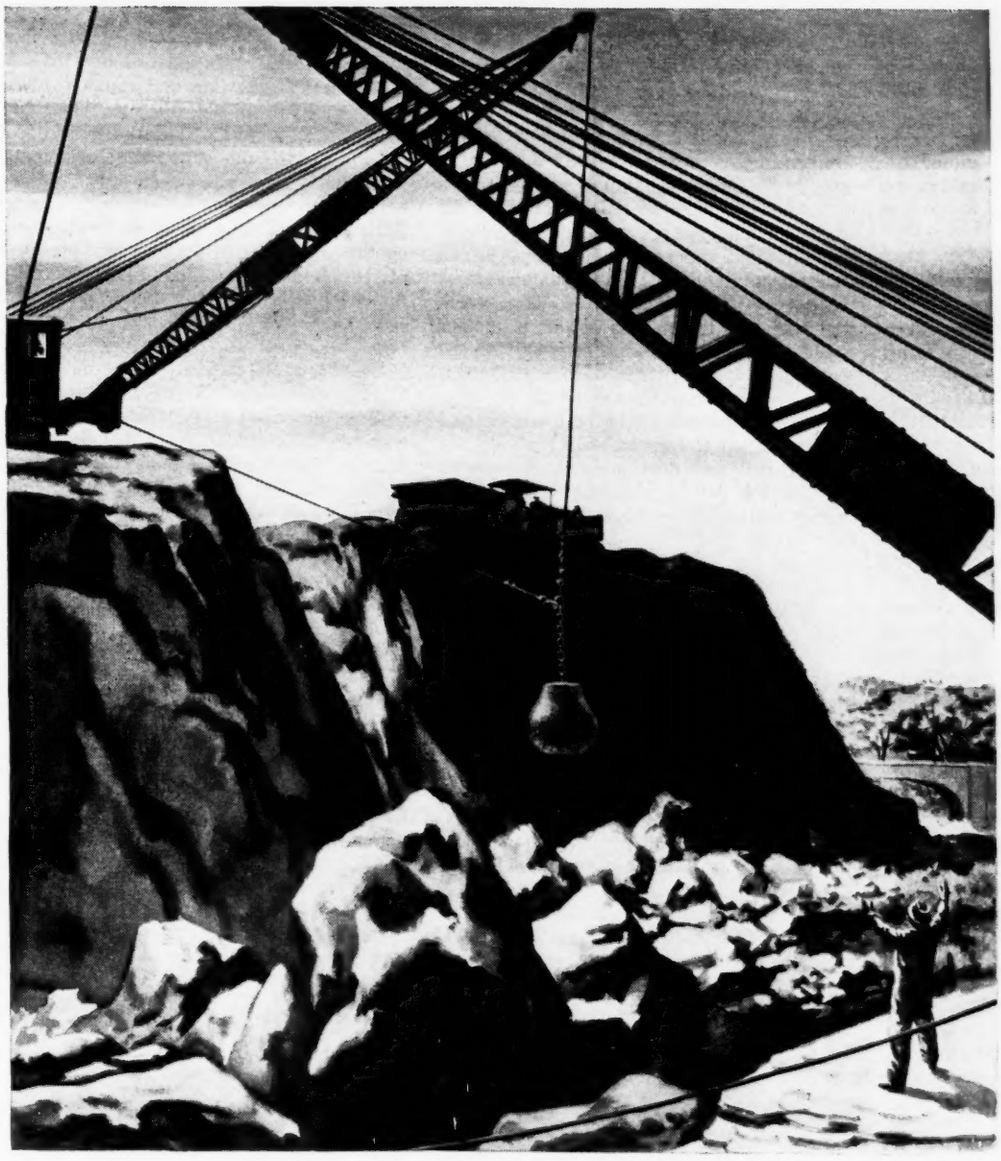
A thermal efficiency of about 18 percent is expected in locomotive operation, stated J. I. Yellott, Locomotive Development Committee, Bituminous Coal Research, Inc., in a detailed report on "Coal as a Fuel for the Gas-Turbine Locomotive." Sketches and drawings showed the latest results of the program, indicating that the equipment should soon be in practical operation. It is expected that the new locomotive will cut fuel costs about one-third.

A colored talking picture of a modern coal-burning steam locomotive in action was shown by the Norfolk & Western Ry. Included were scenes of its manufacture and also the simplicity of greasing and maintenance compared to older-type locomotives.

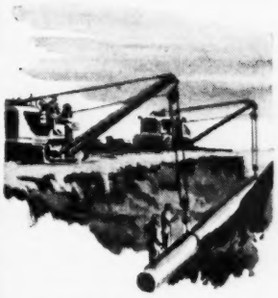
Color motion pictures of the fire bed of a single-retort stoker in operation were presented by T. S. Spencer, Pennsylvania State College, in describing "Some Factors Influencing the Performance of Single-Retort Stokers." He stated that their efficiency has increased from 7.05 lb. coal per kilowatt-hour in 1900 to 3.39 lb. in 1920 and 1.34 lb. in 1941 but that the hand-controlled industrial stoker has been losing out to oil. The objective is to develop a stoker free of manual attention and this has been particularly difficult with fine consists.

"Coal and the Carbon Chemicals Market," by C. R. Kinney, Pennsylvania State College, was abstracted by Prof. D. R. Mitchell. He pointed out that the coal industry does not normally participate in the actual development of chemical uses. In 1943 700,000 tons carbon was used in aluminum manufacture and most of it came from petroleum coke. This is an example of how the petroleum industry is deriving profit in making many products besides oil and gasoline. The coal industry should not overlook such markets and should put more money into the development of chemical uses. Dr. Fieldner pointed out that gasoline can be made more cheaply from oil and gas but that aromatics are made more cheaply from coal and that the industry should hold this market.

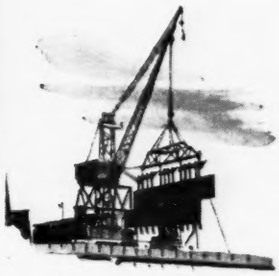
Studies of 590 loading machines, both track and crawler-mounted, showed that the over-all average maintenance cost was 7.5c. per ton, declared L. A. Turnbull, mining engineer, U. S. Bureau of Mines, in presenting a report of the maintenance committee of the Coal Division. The high was 10.2c. in Montana and the low 3.9c. in Wyoming. West Virginia averaged 6.0c.; western Pennsylvania, 8.9c.; central Pennsylvania, 6.6c.; and Illinois, 7.02c. per ton. The over-all average cost was 45 percent labor and 55 percent material. Over-all average for extra equipment was one spare machine for six operating machines. The average time between major overhauls was 19 months, with a maximum of 36 and minimum of four. Over-all maintenance cost



You'll see more and more jobs like these as the nation's new highway and airport building program gets under way. Skull-crackers and draglines use a lot of Preformed wire rope to get the material out.



Laying pipe lines is a fast job today with machines and Preformed wire rope. Improved methods and improved wire rope make the work easier and faster.



Do you worry when you see great weights lifted by shipyard cranes? The operators don't, for they know the Preformed wire rope will hold.

Here you see Post-War Progress in Action...

Wire Rope Makes it Possible



For the busy post-war days ahead, machines are rigged with Preformed wire rope. It lasts longer. It reduces time lost for replacement. It handles easier. It is safer. These operators and the front office agree Preformed is the rope for post-war progress.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

of track and crawler-mounted machines was about the same. It was recommended to the manufacturers that loading machines be constructed so that the cable can be readily removed and installed, more consideration be given to ease of lubrication and that methods of continuous lubrication be considered.

In discussion, James Hyslop, vice president, Hanna Coal Co., pointed out that because of the varying quantities of reject at different mines a more accurate picture would be given on a per-shift basis rather than on clean coal. His company averaged 700 shifts between major overhauls. By recently establishing a central maintenance shop he expected to eliminate a large part of the mine maintenance force. Major overhauls are completed in 16 days and cost per overhaul is expected to be reduced from about $5,500 to $3,500 per machine. His yearly overhaul cost for loading machines is about 2c. per ton.

The kind of fluid is very important, stated Ed. Wilson, Jeffrey Mfg. Co., in delivering a paper on "Maintenance of Hydraulic Systems as Applied to Mining Equipment," by F. J. Wright, of the same company. The manner of storage, containers and foreign matter also affect maintenance of the systems. He pointed out that the same care in changing oil in private automobiles should be exercised with the oil in the hydraulic system. It should be changed at least once a year. In answer to a question by Richard Maize, Pennsylvania Secretary of Mines, he stated that the manufacturers are concerned with the fire danger from the oil used in the hydraulic systems and are experimenting, with the hope that some other suitable liquid may be employed.

An abstract of a paper, "Under-Flux Welding of Mine-Locomotive Wheels," by C. D. Ramsden, Copper Weld Steel Co., was given by A. Lee Barrett, Pittsburgh Coal Co., who pointed out that cost was 40 percent of that of new tires. The difficulty of hard spots, he said, could be eliminated by post heating. The weld is very smooth and requires about 4 lb. per minute and 200 lb. per wheel. It gives a slightly better life than new wheels and at one-half or less their cost. This does not include cost of the welding machines. This type of welding also is applicable to rolled-steel wheels.

Lower cost and constant voltage make alternating current preferable to direct current for operating axial-flow mine fans, declared Raymond Mancha, Joy Mfg. Co., and chairman of the Coal Division ventilation committee, in a paper on "Drives and Safety Signals for Axial-Flow Mine Fans," read by Charles H. Lambur, assistant editor, *Coal Age*. The most frequently used motors for this purpose, in their order of popularity, are: squirrel-cage, synchronous and wound-rotor. With steam power, the turbine has more favorable speed characteristics than the reciprocating-type steam engine. Internal-combustion engines usually are employed as auxiliary power rather than for primary fan operation. Power transmission by direct or intermediate means was detailed and the "V" belt indicated as the most widely used. Various safety signals were stressed. Mr. Lambur added that normally the a.c. motor would not restart after a power interruption and that a restarting device should be installed to avoid injury to the motor.

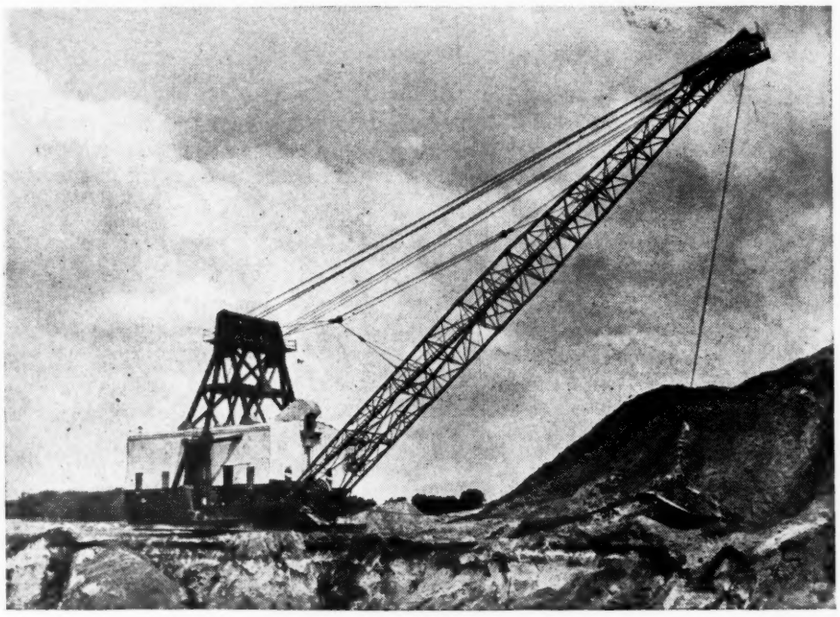
"Psychological Factors Affecting Mechized Mining Efficiency" was the subject of a study by James Hyslop, vice president, Hanna Coal Co., who pointed out that his study included the recommendations of several hundred supervisory men. First of all the management must clearly establish their ideas with the supervisors. Also, it is essential that the foreman be made to understand his responsibility as guardian for the company. Penalization is a difficult program to follow and may boomerang. Housekeeping, he mentioned, might be overdone and the important feature was to keep your eye on the ball and develop work enthusiasm by favorable worker thinking. Some of his mines average 36 to 40 tons per man-shift per section.

Based on 50 shuttle cars, both battery and cable-reel, F. A. Miller, engineer, Consolidated Coal Co., gave a study of "Shuttle-Car Operation Under Favorable Natural Conditions." The storage-battery type uses an elevator for discharge and the cable-reel type has an adjustable-elevator discharge head that is an integral part of the car. Discharge is faster with the second type and can be made in 50 to 60 seconds. Condition of the haulage road can be the most important feature of good shuttle-car operation. His company maintains 10- to 12-ft. roadways 16 ft. wide at turns. A 60-lb. rail drag is pulled behind one car. Good drainage is necessary, as water presents a handicap that may make shuttle-car operation impossible. As an example, in one wet section 8 to 10 in. of bottom coal was left but would not give a good haulage road, and wood roads were the final solution. Good roadway means better operation and rough roadway causes excessive spillage and dust. The cable-reel-type car is preferred if the battery-type car will not last one shift before recharging. Tire shin guards have been used and are believed to reduce tire sidewall damage. Both belt and large-car main haulage are employed and Stuart Jenkins, vice president of the company, added that experience showed belt haulage best when there were excessive grades. Otherwise, large cars were best.

Based on the velocity of sound, Prof. C. G. Brennecke, North Carolina State College, described a "New Method for Determining Hazardous Roof Conditions in Mining Operations." A hole 1 ft. deep is drilled into the roof and a geophone inserted, which registers the reaction of the rock when struck a sharp blow. Results have been sufficiently worth while that the Mine Safety Appliances Co. is doing further development. Original experiments were made in cooperation with the General Insurance Corp.

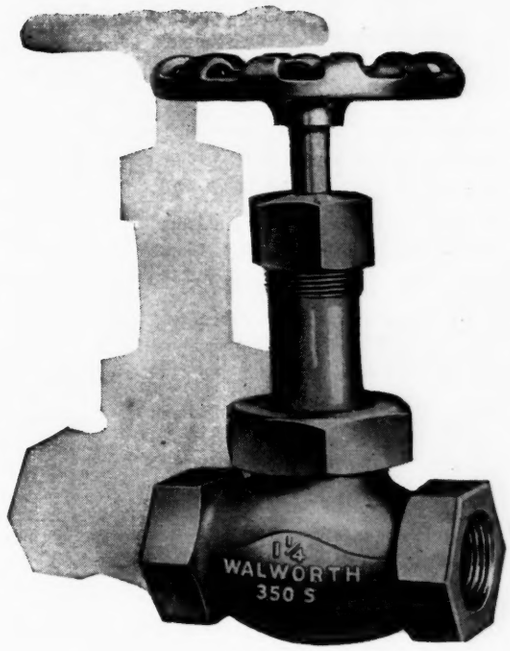
"Roof Control Methods in Great Britain" were described in detail by Dr. B. W. Phillips, mining engineer, Safety Research Board, Great Britain. Many results of experiences in longwall mining were presented and included slides, sketches and graphs. Investigations show that double packing is better than single packing.

An airshaft larger than necessary is extravagant because the increased amortization rate exceeds the reduction in power cost, contended Mr. Mancha in a paper on "Determination of Most Economical Airshaft Size," read by Carl Lee, chief engineer, Peabody Coal Co. Circular shafts were



SETTING THE RECORD STRAIGHT

Through an error in title writing, which went beyond the text of the article, it was inadvertently stated in the February, 1946, issue of Coal Age, p. 101, that the 25-cu.yd. walking dragline installed at Linton Mine No. 28 of the Maumee Collieries Co. was the first machine carrying a bucket of that size to be used in bituminous stripping. Actually, two walking draglines with 25-cu.yd. buckets, supplied by the Marion Steam Shovel Co., were put in service in 1942 by Northern Illinois Coal Corp. The illustration shows one of them in action.



...the WALWORTH

No. 225P

The Toughest Bronze Valve your money can buy

THE stainless steel, non-corrosive seats and discs of the Walworth Number 225P are heat treated to a hardness of 500 Brinell — hard enough to scratch glass and crush nails.

Because of this extreme hardness the valve is tough enough to be closed on sand, slag, scale, and similar flotage without injury to the seating surfaces, and "wire drawing" is practically eliminated. Even after years of severe service Number 225P will assure tight, positive shut-off.

Union bonnet type construction, plug-type seats and discs, deep stuffing boxes, oversize stems and sturdy bronze bodies assure maximum protection against wear and leakage. Valves may be repacked under pressure, when fully opened. Available in both globe and angle types (angle Type No. 227P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. superheated steam pressure, maximum temperature 550F, and 1000 lbs. non-shock service on cold water, oil, gas or air.

For further information on this long-life, economical Walworth Bronze Valve see your nearby Walworth distributor, or write for Catalog No. 42.

Walworth VALVES AND FITTINGS

60 EAST 42nd STREET, NEW YORK 17, N. Y.

stated to be the cheapest, elliptical as more costly, and rectangular the most expensive.

"Wartime Developments in Underground Coal-Mine Mechanization, Ruhr District, Germany," were described by slides and otherwise, by J. W. Buch, U. S. Bureau of Mines. The district, he stated, accounted for about 143 million net tons, or 69 percent of Germany's bituminous coal production, in the 1937-38 coal year. Output per man per shift for underground mines of the district was 2.167 tons. The war created a shortage of skilled workers so the objectives in developing new mining equipment and methods were: to increase the workers' effectiveness, give maximum output from available working places through elimination of deadwork shifts and increase production efficiency in the thin seams to make it possible to mine coal seams developed in the usual course of operations but not normally considered as economically minable. Technical assistance, coordination of effort and cash-prize incentives were supplied by the Ruhr coal mining interests.

The two outstanding developments in mechanical mining equipment were the Eickhoff Schramloader, a combined cutting and loading machine, and the Kohenhobel, or coal planer. Both were intended for use in flat seam longwall mining. Development of the Schramloader was discontinued but the coal planer became more popular. Available data indicate a possible output with the coal planer of 450 tons or more per shift and more than 30 tons per man per shift under favorable conditions. At one mine the planer increased output per man per shift by nearly 3 tons with from 60 to 70 percent foreign labor.

Action of the planer is similar to that of an ordinary wood plane. It plunes a 12-in. deep cut one-third to two-thirds the seam thickness and discharges onto a chain conveyor. Speed of travel is from 20 to 40 ft. per minute. The upper part of the seam caves or is barred down and is loaded out by the planer on its return trip. The solid-blade type was standard design, especially suited for the 3- to 6-ft. thick softer coal beds of moderate pitch. There is another design where the straight rigid blade is replaced by four chisel-type bits for use with hard coal. Each of the bits constitutes the blade of a separately mounted pneumatic hammer. Hoists, sheaves, mountings, conveyors and operation of the planer were described as well as other scrapers, shearing machines and loaders.

Emphasizing that coal cleaning was essentially the same as in this country, except for more medium separation there, H. F. Yancey, U. S. Bureau of Mines, presented a study of "Coal Preparation in Germany and the Netherlands." The preferred concentrating equipment seemed to be the piston-type jig. Sizing before washing was the common practice. A heavy-medium process was used for preparation of a super coal (suitable for hydrogenation) and for a coal uniformly low in ash content that could be used for manufacture of carbon for electrodes and other products. In the Netherlands a new cyclone-type washer is being experimented with. It looks much like the ordinary cyclone dust collector except that it is operated wet. It is attractive principally because fine sizes can be treated efficiently with heavy media and because of the high capacity of small-size units. A pilot plant under continuous operation handled 15 tons per hour with a 14-in.-diameter cyclone.

Colored slide pictures taken after the downfall of Germany and showing conditions in Europe were shown by Dr. H. J. Rose, Bituminous Coal Research, Inc. His subject was "Wartime Developments in British and European Fuel Technology." "The Organization of German Coal Research" was described by Dr. H. H. Lowry, Carnegie Institute of Technology.

"German Developments in the Production of Synthetic Liquid Fuel, were discussed by Dr. A. R. Powell, Koppers Co. He stated that 29 percent of the oil was synthetic and 86 percent of the synthetic oil was derived from coal hydrogenation, as well as 80 percent of the high octane gas. He stated further that in comparison with the United States the Germans were better in setting up research plants and laboratories but this country was better in design of operating plants. "Coal Carbonization in Germany" was described by Dr. F. H. Reed, Illinois Geological Survey. "The Krupp-Lurzi Low-Temperature Carbonization Processes" were presented by L. D. Schmidt, U. S. Bureau of Mines. He stated that in breaking coke the breeze was 7 percent compared to 20 percent with continuous rolls.

The oxygen processes were largely employed in Germany, where the available fuels were not suitable for gasification by the old established methods, such as the intermittant water-gas generator, stated L. L. Newman, U. S. Bureau of Mines, in describing "Oxygen Gasification Processes in Germany." However, development of some processes gave considerable evidence that oxygen was desirable in other regions, too. He pointed out that the economies resulting from increased efficiency and capacity as well as decreased labor costs may well justify the use of oxygen with expensive fuels. However, he stated further that these processes were developed for German fuels and should not be transplanted to the United States without additional critical study and experimentation to adapt them to American coals and economic conditions. "Utilization of German Information for the Production of Synthetic Liquid Fuels in the United States" was discussed by W. C. Schroeder, U. S. Bureau of Mines.

MEETINGS

- **American Mining Congress: annual coal convention, April 29 and 30, Netherland Plaza Hotel, Cincinnati.**
- **Drumheller Coal Operators' Association: annual meeting, tentatively, May 15, Drumheller, Alta., Can.**
- **Stoker Manufacturers' Association: annual meeting, June 3 and 4, Broadmoor Hotel, Colorado Springs, Colo.**
- **Mine Inspectors' Institute of America: 26th annual convention, June 3-5, Sterling Hotel, Wilkes-Barre, Pa.**
- **American Coal Sales Association: annual convention, June 6-8, Homestead Hotel, Hot Springs, Va.**
- **Rocky Mountain Coal Mining Institute: annual meeting, June 6, 7 and 8, Denver, Colo.**
- **American Retail Coal Association: annual convention, June 11 and 12, Morrison Hotel, Chicago.**
- **American By-Product Coke Institute: annual meeting, June 17 and 18, Seaview Country Club, Absecon, N. J.**
- **Southern Appalachian Industrial Exhibit: sponsored by the Pocahontas Electrical and Mechanical Institute, Aug. 22, 23 and 24, Bluefield, W. Va.**
- **American Institute of Mining and Metallurgical Engineers: 75th anniversary meeting, Sept. 16-18, Waldorf-Astoria Hotel, New York City.**

•

European Coal Picture Continues Critical

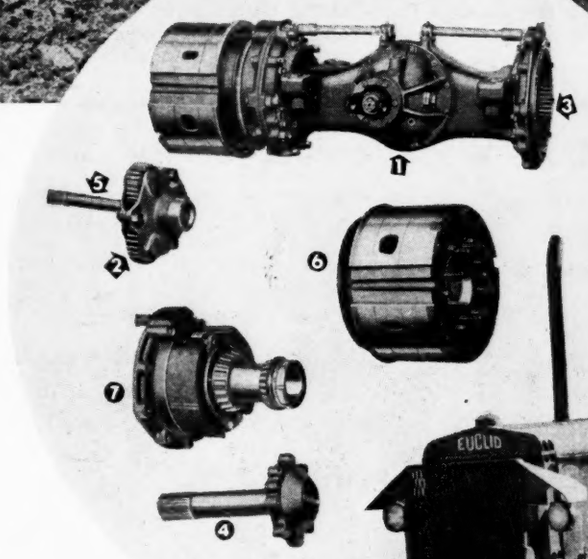
A net deficit of 14 million tons of coal, desperately needed for reconstruction, production of essential consumer goods, processed foods, and clothing and export products, faces northwest Europe in 1946, with but little prospect for improvement in 1947, according to Robert P. Koenig, president of Ayrshire Collieries and until last October colonel of engineers in charge of solid fuels under SHAEF. Colonel Koenig spoke to a group of newsmen at a press interview arranged by the Bituminous Coal Institute at the Biltmore Hotel, New York, on March 7.

Problems of coal and machinery supply during hostilities, reopening of mines on the heels of combat teams and methods of bypassing Army red tape in procurement were reviewed by Colonel Koenig, along with present and future coal supplies, methods of production, manpower resources and nationalization of mines.

Absence of consumer goods from European markets—meaning that the miner finds nothing to spend his wages for—lack of the sort of food the miner wants and fear of paper currencies and inflationary trends are discouraging full production per man-shift. In France, the industry now requires 110 percent of its 1938 labor force to produce 103 percent of its 1938 tonnage. Colonel Koenig pointed out that in France, a nation that normally imports a substantial part of its coal, 103 percent of normal production still leaves a wide gap between supply and need. An even more depressing picture appears in the Saar and Ruhr areas, where 80 percent of normal manpower is now producing only 50 percent of normal output. Continuation of the critical food shortage, ex-



When you need PULL EUCLIDS have it!





Advantages of EUCLID Planetary Drive Axle

The driving parts of the Euclid axle are: (a) — a primary reduction consisting of conventional spiral bevel ring gear, pinion and differential (1), (b) — secondary reduction of two floating planetary gear sets (2) each made up of a sun gear, three planetary gears and internal ring gear (3). The only parts carrying the full driving load are the outer drive axles and hub caps (4). The inner axles (5) carry less than 1/5 of the load delivered to the driving wheels (6). The use of the planetary reductions makes possible minimum gear reductions in the transmission and differential and results in much lighter loads being imposed on all parts between the planetary gears and engine.

Full-floating drive axle has exceptional strength

One reason for the wide use of Euclids on tough, off-the-highway hauls is the double reduction planetary drive axle used in both Rear-Dump and Bottom-Dump Euclids.

By this system of gear reduction, tremendous pulling power is attained with comparatively little burden on the intermediate driving parts. This results in greatly prolonged life of axle driving parts.

The Euclid drive axle is full-floating — all of the rear axle load being carried on heavy-duty tapered roller bearings mounted on hollow spindles which keep axle shafts and gears entirely free from vehicle and payload weight. The entire drive axle assembly is precision built and all working parts are completely enclosed in an oil bath.

The dependable performance of the Euclid axle — its strength and capacity — is unequaled by any other axle in heavy duty hauling equipment. It is an important factor in the long life and efficiency of Euclids.

The EUCLID ROAD MACHINERY Co. · · · CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*



Col. Robert P. Koenig.

tended absence of consumer goods, and the lower efficiency of most mining machinery, with scarcity of spare parts, are likely to keep production at low levels through 1947.

Britain's outlook is little brighter, according to Colonel Koenig. Coal output has declined steadily since 1937, and during and since the war production per man-shift has fallen off for lack of consumer goods and attractive food rations. Moreover, British mines and equipment are antiquated, labor-management relations are historically poor and younger men are not being attracted to the mines. There is speculation that nationalization will stabilize production, markets, prices and manpower, but the results, the speaker stated, cannot be analyzed for five to ten years after nationalization has been effected. Together with capital equipment sent to Britain under lend-lease—cutting machines, conveyor belts and locomotives, as well as equipment for stripping—nationalization, with its long-term program for development of new collieries and mechanization of those now in operation, may force an upward trend in production as the program settles down.

The coal deficit among European nations that are not self-sufficient is expected to gross 59 million tons, said Colonel Koenig. Imports to be made available from Germany, Poland, the United States and other sources can be expected to reduce the deficit to a net of 14 million tons. It appears that Europe simply will have to get along without these 14 million tons. Even if it should be made available from other extra-European sources, there is question as to the capacity of port facilities for handling larger imports, to say nothing of the drain that would be imposed on low foreign exchange resources by further imports.

•

Hudson Honors Two Officials

More than 400 employees of the Hudson Coal Co. attended a testimonial dinner held March 9 at the Hotel Redington, Scranton, to honor Elmer Williams, superintendent of the Delaware and Pine Ridge collieries, and James Dixon, recently advanced from the superintendency to special engineer at the company's Scranton headquarters.

Isaac Forster, chairman, delivered the address of welcome and introduced State Mine Inspector Joseph C. Hines, who officiated as toastmaster. The program included remarks by Superintendent John Reid; Michael Kosik, district president, U.M.W.A.; Congressman Daniel J. F. Flood, and Judge John S. Fine.

Cadwallader Evans, Jr., vice president and general manager of the Hudson Coal Co., presented the guests of honor with various gifts.

Coal Exhibit Draws Home Builders

Centralizing on the thought that "Coal heat adds selling value to homes," the bituminous coal industry, represented by the National Coal Association, gave an important demonstration of the possibilities for carefree automatic coal heat at the Exposition of the National Association of Home Builders, held in Chicago Feb. 25-28.

For four days, builders from all sections of the United States crowded the coal exhibit, where they received first-hand information on the latest automatic coal-burning

Stonega Mines Win "Coal-for-Victory" Awards



Operating officials of the Roda No. 5 mine, Stonega Coke & Coal Co., Roda, Va., pose with the 1945 efficiency certificate awarded by the editors of Coal Age for increasing man-hour efficiency in the first seven months of 1945 over 1944. In the front row, left to right, are: D. H. Clark and J. Frazier, section foremen; E. M. Smith, general mine foreman; B. C. Suttle, section foreman; L. S. Lyons, assistant superintendent; back row: N. H. Ingles, superintendent; M. H. Marrs, C. C. Lowe, H. M. Boley, section foremen; W. E. Felts, chief electrician; R. C. Ward, electrician; and C. J. White, general night foreman.



At Stonega's Derby No. 1 Mine, Derby, Va., supervisory officials are shown with their 1945 "Coal-for-Victory" efficiency-award certificate. The front row, left to right, include: B. M. Neel, superintendent; F. E. Turner, chief electrician; O. S. Powers, general mine foreman; back row: R. Ritchie, general night foreman; R. Stewart, R. Clendenin, section foremen.

GENERAL DEEP CLEAT



Best Tire "on earth"

Equipped with General Deep Cleat Tires, this Adams Motor Grader is widening and grading near Norton, Kansas.

THE GENERAL'S "deep bite" tread was specially designed by America's foremost quality tire engineers to give *maximum traction* on soft ground, mud, sand or gravel.

The best tire "on earth"... the General Deep Cleat . . . is self-cleaning . . . built for rugged service with exclusive "shock absorber" construction that resists abuse and service damage.

For longer, low cost tire service, equip driving wheels with General Deep Cleats . . . trailing wheels, too, if all tires are to be interchangeable.

THE GENERAL TIRE & RUBBER CO.
AKRON, OHIO



The GENERAL TIRE

GENERAL OFF-THE-ROAD TIRES

devices and smokeless-type furnaces and stoves. Also portrayed was a distinctive idea for the group heating of single dwellings from a central station fired by coal. Nearly 6,000 builders, architects and home planners attended the convention, of which the exposition was a major part, and a large proportion of them called at coal headquarters.

The bituminous industry display, occupying the space of four ordinary booths and one of the largest on the exposition floor, was arranged and supervised by Marc G. Bluth, manager of the Chicago office, with the cooperation of a group of coal executives and engineers. By use of furnace, stoker and stove models and special displays the exhibit emphasized that coal-fired heating apparatus for the home can be made just as automatic and convenient as the owner desires it. Representatives of the Bituminous Coal Institute, Bituminous Coal Research and other coal organizations participated in the presentation.

Still in the stage of development, plans were illustrated for the central heating of groups of small homes. Literature made available covered the whole field of apparatus and installations necessary to obtain most satisfactory results. This included "Small House Plans," published by the Bituminous Coal Institute; "Basement Plans and Flue Planning for Modern Homes," published by the National Coal Association, and other aids on central heating systems and economical heating.

•

Operators Active On New Projects

A new strip mine, expected to produce 2,500 tons of coal daily, is being opened south of Odon, Daviess County, Ind., by the Central Indiana Coal Co., Indianapolis, according to announcement by Robert H. Sherwood, president.

The company has under lease about 3,000 acres of coal and has let a contract to the Link-Belt Co., Chicago, for the erection of a new preparation plant, which will include a washer. A 25-cu.yd. Bucyrus-Erie dragline will be employed, and 25-ton trucks are to be used to haul the coal from pit to tipple. The mine is to be connected to the Chicago, Milwaukee, St. Louis & Pacific R.R., according to the company announcement, and plans now call for operation to start by next Jan. 1.

The Ohio Power Co., according to an announcement of March 1, has acquired a 1,000-acre coal tract located near Cannelville, Ohio. Approximately 4,000,000 tons of fuel is available in this property for use of the company's giant power plant at Philo.

Purchase of 215 acres of strip-coal land two miles from Cadiz, Ohio, by the Kenwood Coal Co. for $107,800 at a sheriff's sale March 1, was reported to be considered a new high for strip-coal land in that area. Similar land has been privately sold previously for less than $50 an acre.

Sinking of a new mine by the Peabody Coal Co. in Christian County near Sicily, Illinois, has been confirmed by D. H. Devonald, vice president of the company. Details of the new operation and a tentative opening date are not available, according to the company's statement.

The Tennessee-Pennsylvania Coal Co. is reported to have begun a new strip mine near Brayton, Bledsoe County, Tenn. This is the first stripping activity for this particular locality. The company controls several thousand acres of land, and the coal will be hauled to College Station, in Sequatchie Valley, for loading into railroad cars.

The purchase of coal land in DeSoto township, Jackson County, Ill., by the Truax-Traer Coal Co., at an indicated consideration of $600,000, has been made a matter of record in the county office. The property was transferred by A. B. McLaren and R. F. McLaren, veteran investors in strip-coal and other coal lands in the southern Illinois belt.

Acquisition of the Wyoming Mining Corp., which owns and operates the Linco mine, near Oceana, Wyoming County, W. Va., by the Crozer Coal & Coke Co., Bluefield, W. Va., was announced March 20 by E. C. Page, president of Crozer. The transaction includes 6,000 acres of coal land as well as a complete town. The town and mines have been built and developed in the last six years. The mine is completely mechanized and present monthly production of 25,000-30,000 tons is to be considerably increased with the installation of new equipment and additional labor, it was stated.

New personnel will include John J. Lincoln, as director and active adviser, and J. P. Nowlin, Beckley, as general manager, but the company emphasizes that the organization at the Linco mine will remain intact under the present superintendent, G. E. Minns. The Campbell Creek coal seam is being mined and marketed as a premier by-product and general-purpose coal. The General Coal Co., Philadelphia, has been appointed exclusive sales agent, effective March 31.

Coal Activity

Bituminous Coal Stocks

	Thousands Net Tons Feb. 1 1946	P.c. Change From Jan. 1 1946	P.c. Change From Feb. 1 1945
Electric power utilities	14,302	− 2.5	− 0.5
Byproduct coke ovens	5,599	+16.5	− 1.1
Steel and rolling mills	611	+ 3.0	− 8.3
Railroads (Class I)	9,391	+ 4.5	−17.0
Other industrials*	13,931	+ 3.9	− 2.9
Total	43,834	+ 3.3	− 5.5

Bituminous Coal Consumption

	Thousands Net Tons Jan. 1946	P.c. Change From Dec. 1945	P.c. Change From Jan. 1945
Electric power utilities	5,702	− 1.8	−22.2
Byproduct coke ovens	5,655	−22.9	−28.7
Steel and rolling mills	670	−27.3	−37.8
Railroads (Class I)	10,978	+ 3.8	− 8.6
Other industrials*	13,893	+ 3.8	− 5.0
Total	36,898	− 4.0	−14.1

*Includes beehive coke ovens, manufactured-gas plants and cement mills.

Bituminous Production

February, 1946, net tons	49,960,000
P.c. change from February, 1945	+3.7
January-February, 1946, net tons	104,060,000
P.c. change from Jan.-Feb. 1945	+5.0

Anthracite Production

February, 1946, net tons	4,781,000
P.c. change from February, 1945	+7.5
January-February, 1946, net tons	9,763,000
P.c. change from Jan.-Feb., 1945	+13.3

Sales of Domestic Stokers

January, 1946	15,239
P.c. change from December, 1945	+15.9
P.c. change from January, 1945	+124.4

Index of Business Activity*

Week ended March 23	166.0
Month earlier	144.0
Year earlier	232.7

**Business Week*, March 30.

Electric Power Output†

Week ended March 23, kw-hr	4,017,310,000
P.c. change from month earlier	+2.4
P.c. change from year earlier	−8.7

†Edison Electric Institute.

Inadequate Machinery Retards British Mines

LONDON (McGraw-Hill World News Bureau)—The serious manpower shortage in Britain's coal mines and the Labor government's inability to check absenteeism lend added importance to a report on the wartime developments in mechanization just issued by the Ministry of Fuel and Power. In addition to a solution of the labor problem, concentrated effort on development of suitable machinery, continued research and experimentation in the application of new methods, and the immediate introduction of locomotives must be pushed to the utmost, G. M. Gullick, mechanization adviser to the Ministry, stated.

According to the report, the proportion of coal cut by machinery increased between 1940 and 1944 from 64 to 72 percent and that of coal machanically conveyed from 61 to 69 percent. It is expected that the figures for 1945 will show further increases.

The results achieved by individual collieries from installation of machinery are striking enough to dispel any remaining doubts about the value of mechanization in promoting increased output. By using normal longwall mechanization, one company increased output per man-shift from 33.3 cwt. in 1939 to 52.6 cwt. in 1944.

Better results still are anticipated from power loading and the combined cutter-loader. Examples of increased production from the use of the Meco-Moore cutter-loader show output per man-shift raised in one case from 6.79 to 9.05 tons, and in another from 5.00 to 8.09 tons.

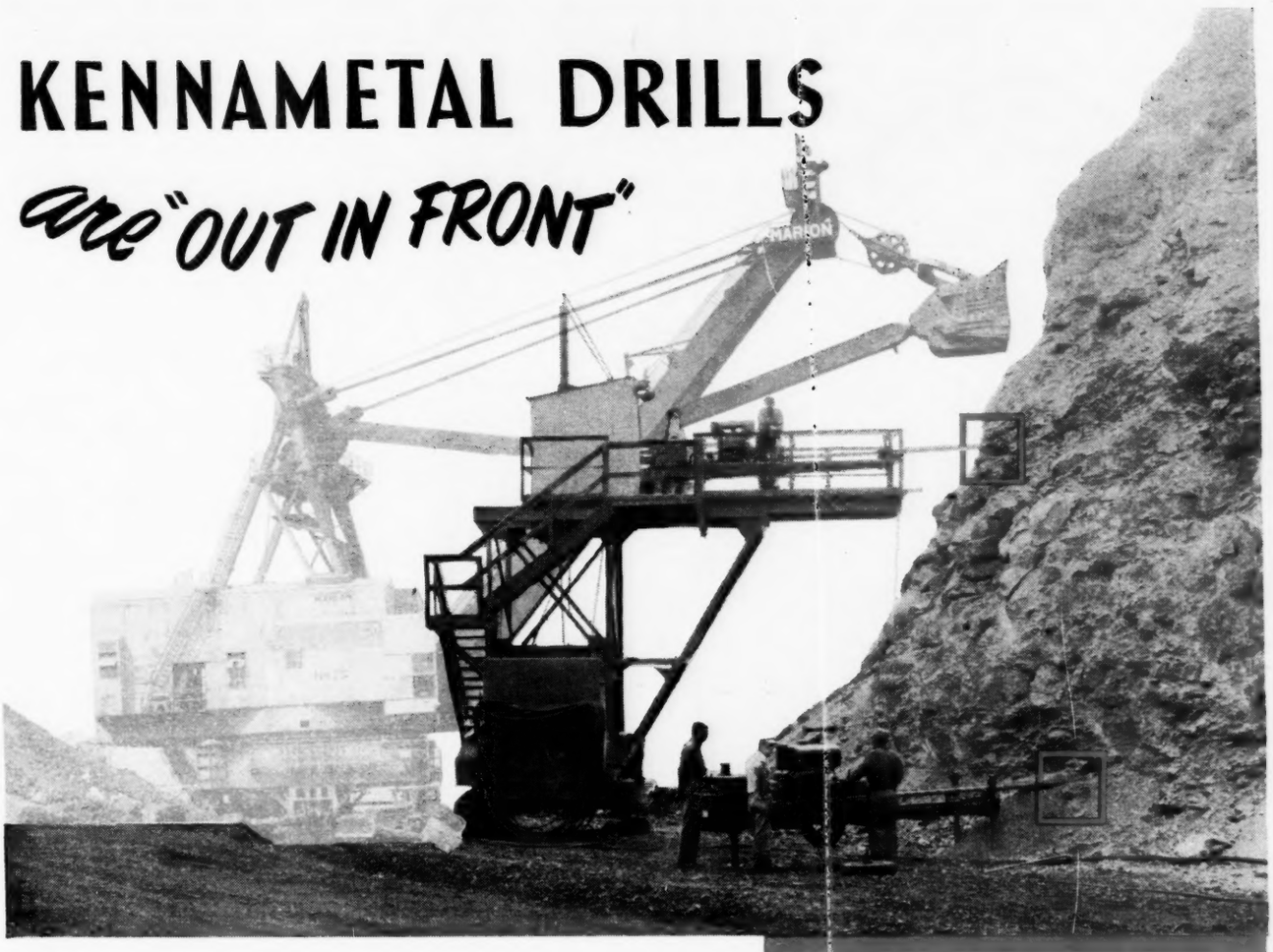
Extensive utilization of this machine (50 were ordered by the Ministry late in 1944) and of the new thin-seam models now being designed undoubtedly will form a major part of the mechanization program under government ownership.

Although output per man-shift has more than doubled in severael cases where American-type mobile loaders and duckbills have been installed, the progress so far made with these and other forms of mechanized room-and-pillar mining apparently has not been rapid enough to justify any immediate large-scale expenditures in this field.

The most urgent problem, however, is underground transport. The lack of loco-

KENNAMETAL DRILLS

are "OUT IN FRONT"



Before the shovel, the shot . . . before the shot, the hole . . . before the hole, the DRILL.

If it's a Kennametal Drill, results are outstanding—more holes, faster, better, cheaper.

You pay less for Kennametal-drilled holes, in time, in man-hours, in power, in bit replacement and resharpening.

If you're using these bits now, you will know what we mean. If you're not, the following typical field experience will be interesting:

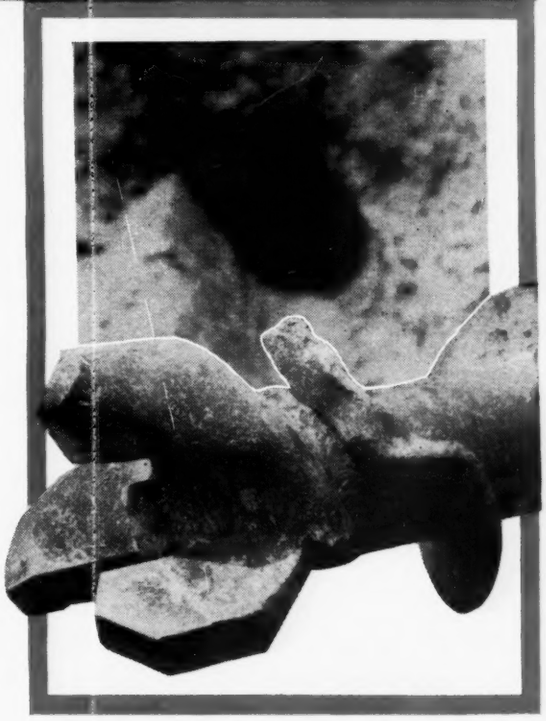
- In overburden consisting of hard shale matrix imbedded with large limestone nodules, a Kennametal 6½" diameter three-way bit put down 15 holes 60 feet deep in 390 minutes actual drilling time—an average of 26 minutes each (21 minimum, 35 maximum). After this 900 feet of drilling the bit was not dull enough to require resharpening!

Here are the reasons for such good service:

- These bits are revolutionary in type and design. They are *tipped with Kennametal,* the same hard, tough, durable cemented carbide that for years has produced outstanding results when used on metal-working tools.
- Cutting edges are scientifically contoured for fast drilling to accurate size throughout the bit life, including many regrinds. An effective core breaker helps to keep the hole clear and prevent bit stalling.
- Bodies are sturdy, heat-treated alloy steel castings having welded-in bar steel shanks, adaptable to fit common types of augers. Hexagonal type is standard, but square or splined can be furnished when ordered.

A small investment in Kennametal Drill Bits will help you realize the maximum returns from a large investment in shovel capacity for removing overburden in stripping operations.

Four sizes are available—3½", 4", 5", and 6½" diameters. Additional particulars, and prices, sent promptly upon request.



Photograph above shows excellent condition of Kennametal Rotary Drill Bit after being used for one month, drilling holes in customary Seam 8 overburden.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

TRADE MARK REG. U. S. PAT. OFF.

KENNAMETAL Inc., LATROBE, PA.



What happens when this Red Elastic Collar becomes part of a nut? The nut becomes an ESNA Elastic Stop Nut! And it provides permanent protection for any detachable or adjustable assembly.

How?

First, an Elastic Stop Nut *locks in position anywhere on a bolt or stud.* Every bolt can be precisely prestressed to carry its full load. Positioning devices can be adjusted with precision. Vibration cannot disturb these settings—because the Red Elastic Collar eliminates all play between bolt and nut threads with its full contact, permanent grip.

Second, it *prevents thread corrosion.* Moisture is sealed out. Adjustment or removal is easy—any time.

Third, it *prevents thread damage.* Full thread contact in the Red Elastic Collar keeps the metal threads firmly seated. Axial play caused by vibration or stress reversal is dampened.

Fourth, it *prevents seepage of liquids past bolt threads.* Permits nut to be used as a sealing device.

Fifth, it *prevents maintenance waste.* The Red Elastic Collar, which does not injure the bolt or its plating, permits repeated usage.

Here's a challenge: Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information write for literature. Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents in principal cities.

ESNA

ELASTIC STOP NUTS

INTERNAL WRENCHING · ANCHOR · INSTRUMENT MOUNTING · SPLINE · CLINCH · GANG CHANNEL

PRODUCTS OF: **ELASTIC STOP NUT CORPORATION OF AMERICA**

EQUIPMENT APPROVALS

Two approvals of permissible equipment were issued by the U. S. Bureau of Mines in February, as follows:

Joy Mfg. Co.—Type 32D12P shuttle car (storage-battery operated); three 5-hp. motors; 96 volts, d.c.; Approval 549; Feb. 8.

Hose-McCann Telephone Co., Inc.—Models WT and W Hose-McCann sound-powered telephone; Approvals 904 and 904A, respectively; Feb. 20.

motive haulage, as the Reid report showed, is one of the major weaknesses of British coal mining, and the Minister's report for mechanization suggests that little progress has since been recorded. There also is much room for further application of the latest mechanical methods in stowing and drilling.

One of the chief obstacles to a realization of the Ministry program is the inadequacy of the mining machinery industry in Britain. True, over-all capacity has been expanded since 1941 from 45 percent of prewar capacity to 130 percent; output of coal cutters has been doubled since 1942; and between 1943 and 1945 output of conveyors rose from 1,042 to 1,652, and power loaders from 57 to 138. But production on this scale is a drop in the bucket compared with the needs. Prewar output of coal-mining machinery was only around £3 to £4 million a year, part of which went for export. This figure might be compared with the average annual expansion program envisaged in the Coal Bill of about £25 million, embracing extensive mechanization, which may well account for as much as half that sum.

Ministry plans for increasing output of mining machinery, including a scheme for the production of standardized American types, are still being held up by lack of sufficient designers, draftsmen and skilled labor. Continued failure of British manufacturers to break the bottleneck will force the government to buy machinery in the United States or acquire it from the Continent.

More success has attended the Mines Mechanization Training Center at Sheffield, but even here the entries for the six-months course to train young miners have been disappointing.

The British coal crisis can be solved only by mechanical mining and modernization of the mines. The report of the Ministry of Fuel and Power, while indicating that some progress has been made, is of value mainly for the revelations it contains as to how much still remains to be done.

In recent discussions with Emanuel Shinwell, Minister of Fuel and Power, British miners have demanded immediate and thorough correction of past working conditions, according to Gordon Schaffer, indus-

LOAN TO BRITAIN

. . . *Investment in World Economic Unity*

CONGRESS should give swift and confident approval to the proposed loan to Great Britain.

Few other issues of foreign policy in the present troubled world lend themselves to such clear appraisal of where our National interest lies.

In simplest terms, the question is whether we should extend to Great Britain a credit of $3¾ billions (plus $650 millions in payment for lend-lease balances) in return for her promise to repay principal with interest over a fifty year period starting at the end of 1951, and her pledge to give the fullest possible support to the kind of world trading system which it is the declared policy of both the United States and the United Nations Organization to promote.

We Can Afford to Make It

The sum we hazard is not inconsiderable, but financial risks have meaning only when related to resources. The line of credit provided by the loan will amount, at most, to a claim on 2/5 of 1 per cent of our gross output for the five to six year period over which it may be used. The interest rate charged, while moderate, is higher than our Treasury is paying upon current borrowings. The risk entailed is well within our resources as a creditor. In the considered judgment of the American and British technical experts who thrashed through the intricate accounting for three painful months, the amount and terms offered will suffice to allow Britain, under rigid austerity, to relax her system of foreign trade restrictions, and to expand exports sufficiently to pay her debt commitments.

Against the considered risks of extending the loan, there must be weighed the certain costs of refusing it. Without the loan, Britain has no recourse but to maintain and extend the system of bloc trading which she adopted under stress of world depression and world war. If that is the route Britain follows, she will carry with her a large part of the sterling area countries — all British Commonwealth and Empire countries (except Newfoundland and Canada) plus Egypt, Iraq, and Iceland—and many of the nations with which the United Kingdom has payment agreements (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru, Uruguay, Belgium, Czechoslovakia, Denmark, Finland, France, Netherlands, Norway, Portugal, Spain, Sweden, and Turkey).

Altogether, the United Kingdom's orbit accounts for more than half of the world's imports and exports combined. It likewise is crucial to the trade of the United States. In the years immediately preceding the war, the sterling area and payment-agreement countries provided just under one-half of both the import and export trade of this country.

Russia, of course, will continue to conduct her foreign commerce exclusively upon a state-trading basis. Before the war, the Soviet Union transacted only a little more than 1 per cent of foreign trade business, but its future sphere of influence will be large—conceivably embracing as much as 30 per cent of total international trade.

We Cannot Afford to Refuse It

If the weight of British influence in foreign trade is thrown toward the Russian pattern rather than toward ours, it is apparent that bloc trading, with all of is supporting devices—bilateral deals, exchange controls, import and export quotas, subsidies, currency manipulations and the like —will be the prevailing pattern for foreign transactions.

In self-protection, the United States would have no alternative but to conform to the dominant pattern. We should be forced to form our own bloc, and to enter into active economic warfare in bidding for trade concessions against the offers of our rivals. How well we would do this is problematical. To the game we would bring the largest economic potential in the world. But our handicaps would be equally impressive.

First, under a system in which political and economic motivations are inextricably fused, a democratic nation, and particularly one with a tradition of freedom in its domestic enterprise, would operate at a great disadvantage. We should inevitably be driven toward more and more government control of our entire economy.

Second, with a pattern of foreign trade in which our exports habitually are greater than our imports, our bargaining position in international trade is much weaker than our over-all economic strength would suggest. Under state-controlled trading we should still find it difficult to compete successfully without resort to loans, and under these conditions our loans would be supporting a system alien to our choice and interest.

Third, under a regimented system which made economic decisions subservient to political considerations, it is virtually certain that the volume of world trade would shrink. That was the clear experience of the nineteen-thirties. Thus, the

standard of living in the United States would suffer in common with all others, and we would be forced into a particularly drastic curtailment of certain war-expanded segments of our economy, at the very time when a large portion of the world is most in need of the products they can produce.

Weighing the Alternative Costs

In the years immediately ahead it is certain that from two-thirds to three-quarters of all international trade will be transacted either in pounds or dollars. If both circuits are linked in a determined effort to restore competitive world markets, to which buyers and sellers alike have access without discrimination, that will be the dominant system of foreign trade. If the sterling group with its satellites organizes a closed grid, our exclusive effort cannot preserve the trade pattern that we believe offers most to us and to the world.

No one can accurately measure the costs to the United States of refusing the loan and accepting the consequences. But unquestionably they would dwarf to insignificance the sum risked in the proposed credit. We would lose through the shrinkage of our trade, through the wrench of violent readjustments in our production patterns, and eventually through the curtailment of our over-all output below what it would be under an open rather than a closed system. We would lose heavily in economic liberty under a procedure that can be followed with success only by a close regimentation of production as well as trade.

Most of all, we would lose in prestige, through demonstrating that we are still unprepared to exercise a world leadership to which our giant stature as the possessor of almost half of the world's economic capacity entitles us. Once again we would be exhibiting to the world political feet of clay supporting an economic frame of heroic proportions.

It Is Far from a "Soft" Bargain

There has been some disposition in this country to regard the loan to Britain as a somewhat "soft" and generally unprecedented transaction that smacks of charity. This is the sheerest nonsense.

In the first place, the kind of economic system we want has never functioned and cannot operate now without a lender. For many decades prior to World War I Great Britain filled the creditor role. In 1913 her foreign investments totaled $19 billions, and she not only made such transactions pay, but they proved her salvation through two grim wars. Her credits helped in the industrial development of a large segment of the world, including the United States. Of all the nations in the world, only the United States can assume now the mantle which Britain no longer can support.

In the second place, the terms of our proposed loan to the United Kingdom are far from easy. Britain put a substantially greater proportion of her relatively meager resources into the war than we did, and dissipated a large share of her foreign holdings in the process while accumulating an outside debt of crushing magnitude. On a per capita basis her internal debt is greater than ours. Many Britons feel that our proposed loan is too small, and its terms too rigorous. If the amount proves to be inadequate, we shall have to consider supplemental aid at a later date. But the majority believe that the present offer gives a fighting chance to restore the system of world trade that we and they both want, and upon which the World Bank, the Monetary Fund, and the International Trade Organization under United Nations aegis are based. It is certain that without our loan all of this will go by the board.

In the third place, our proposed loan is far from being without precedent. Canada, which is linked by far closer economic ties to us than to the Empire, already has provided for a loan to Britain of $1,200,000,000. This amounts to almost a third of what we propose to lend, although Canada's population is less than 10 per cent, and her income is little more than 5 per cent of ours.

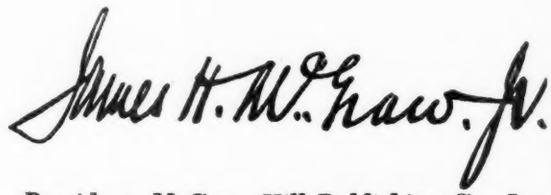
Shall the United States Lead or Follow?

The way to exercise leadership is to lead. Nothing could be more futile than to go half way toward establishing the economic order for which we stand, and then withhold the crucial measure that will make it work. Failure to approve the loan to Britain will be a clear default of leadership. Failure to approve it promptly will dissipate its effectiveness.

It has been officially stated that the British loan is a unique case that will establish no precedents for further credits to other nations. It is exceptional in its importance to our aim. But if the United States expects to make its economic program the dominant one for world trade, it must continue to exercise the creditor function without which that program cannot persist.

The most that we should ask is that future loan transactions be scrutinized as was this one to see that they offer comparable security and comparable return in support of the program for which we stand.

For the loan to Britain, it can be said that never before has one nation had an opportunity to gain so much at so little risk as has the United States in this uniquely decisive case.



President, McGraw-Hill Publishing Co., Inc.

trial correspondent of the *Reynolds News*, London.

The "Miners' Charter" put forth is regarded by the British miners as a necessary counterpart to the nationalization of their industry now under way. They are asking for modernization of existing pits, the sinking of new pits as rapidly as possible, training schemes for young men, and other senior posts to be open to all.

New safety laws to meet conditions of modern mining and to prevent diseases are called for, together with compensation rates guaranteeing a proper standard of living to those injured and to dependents of those killed.

Continuance of the guaranteed-work principle (on which production and industry in Britain was based in wartime), together with a 7-hour day for underground workers, a 40-hour week for surface workers, and an all-round 5-day week without loss of pay, is urged. Two weeks' paid vacation in addition to the ordinary bank holidays also is asked for, and the view is expressed that miners unable to follow their employment after the age of 55 should be granted pensions.

The building of new towns and villages to meet the serious shortage of houses in mining areas and the provision of social facilities and transport services to break down the isolation which for so long has cut off the colliery villages from the rest of the country also are important points.

Steps must be taken, the miners say, to inject new blood into the industry, yet under present conditions they will not send their sons into the mines. With few entrants into the pits, the average age of the British miner has steadily increased. Falls in production and increased absenteeism can be put down in very large degree to the fact that the miners are growing old and that the young men are not there to take their place.

Mr. Shinwell told the representatives of the National Union of Mineworkers that steps were already being taken to implement some of their demands. In fact, the main point now at issue between the miners and the government is the demand of the union that trade union membership should be compulsory. To this demand the government has not yet given its answer. It raises a question that will become pressing as the government's nationalization policy is put into practice in other industries.

Where a union is strong and well organized, as in the case of the miners, such provision would not have a very far-reaching effect, but any demand for state enforcement of trade-union membership involves factors to which the trade union movement as a whole will have to give careful consideration.

•

Anthracite Standards Specified by OPA

Quality and size standards for all sizes of anthracite were specified by the Office of Price Administration effective March 5. The size standards are identical with Anthracite Institute specifications except for a



IN AIR COMPRESSORS . . . THERE ARE *Masterpieces, too*

Specialized workers make Schramm Air Compressors with that all-important "Know-How". So, when you get your Schramm Air Compressor you know you are not only getting a compressor with many exclusive features, but you know Schramm workers are assembling the features right, testing them thoroughly, and making a Masterpiece!

Schramm, with its enlarged facilities and modern plant at West Chester, produces on a large scale for industry. Schramm's expert workers and larger, modern facilities are geared to meet your needs for Air Compressors, both portable and stationary, in a wide range of sizes, for any requirements.

Today's features of Schramm Compressors are those that have stood up so well under the test of actual performance. These features include (1) 100% watercooled (2) mechanical intake valve (3) forced feed lubrication (4) main bearings between every cylinder (5) compact and lightweight.

Post-war industry will find many uses for the versatile Schramm Air Compressor. We invite you to write today for our new catalog and become acquainted with the construction features and details of the many Schramm models.

SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

40% MORE HOLES PER DAY



Actual operating records of the many machines in use prove that statement. The hydraulic feed plus fingertip control plus individual operating jacks make the job of horizontal drilling fast and sure even through the toughest formations. Compact, heavy and rugged, the *McCarthy* handles augers 4" to 9" Diameter—and drills horizontally 150 ft. Easily moved from job to job. Designed by a Strip Mine Driller who knows what operators want in drilling machines.

SEE THE McCARTHY BEFORE YOU BUY

In writing, be specific as to what you are drilling, depth, etc., so we can give you factual data.

PHONE — WIRE — WRITE

SALEM TOOL CO. SALEM OHIO

Drilling and earth boring specialists. Manufacture all types of augers from 1¼" to 8" Dia. and distribute complete line of mining tools and supplies.

WHY PROMET BEARING BRONZES GUARANTEE LONGER SERVICE

Specializing in bronze bearings and bushings for coal mining equipment, with a specific formulae designed for each application, we give you a money-back guarantee of longer service and lower maintenance cost.

Promet Mine Special Babbitt, Lead Base. All virgin metals, perfectly alloyed and heat-treated. Fine, velvety grain. Withstands tremendous loads at high speeds and temperatures. The coefficient of friction is considerably less than that of tin babbitts, reducing power loss and wear. Entire bearing surface wears uniformly without pitting. Unaffected by moisture. Simply heat to 900° to 950° F. and pour. Can be heated to 2000° F. without injury. Repouring only refines it. No appreciable shrinkage, hence a better contact with supporting shell; a more solid, rigid bearing. Contains practically no dross. Supplied in 10 lb. pigs.

PROMET The Engineered BRONZE

Bronze Axle Bearings Journal Liners Bushing and Wearing Parts For All Equipment

Jeffrey, Goodman, Westinghouse, General Electric, Sullivan, Joy, Oldroyd, etc.

Round, hexagon, square bar stock. Rough cast. Semi-finished. Cored stock all sizes (by ⅛" steps) from ½" minimum core to 12" O.D. and 12" lengths. Available in 6 grades of hardness.

Promet Bronze Castings to Your Patterns

Any size, shape or section up to 3,000 lbs. each. Pattern making, designing and machining.

Write for free booklet.

THE AMERICAN CRUCIBLE PRODUCTS COMPANY

1307 Oberlin Avenue • Lorain, Ohio, U. S. A.

Prompt deliveries can usually be made from stocks maintained at

BECKLEY, W. VA., The Universal Supply Co., 1297 S. Kanawha St. Phone 3642 — LORAIN, OHIO, The American Crucible Products Co. Phone 6963

Other Representatives

ALTON, ILL., Frank E. Kline, 823 Blair Ave. Phone 3-8674
BIG STONE GAP, VIRGINIA, C. P. Cawood Box 390
BIRMINGHAM 3, ALA., O. D. Lindstrom Equipment Co. Box 103
DENVER, COLO., Urquhart Service, 16th St. at Blake Phone Main 0331
MT. LEBANON, PA., J. E. Riesser, 710 Roselawn Ave. Phone LE 5478
WHEELING, W. VA., Pollish & Company, 110-111 Fidelity Building Phone 1795
WILLIAMSON, W. VA., Williamson Supply Co. Phone 1200

fixed allowable maximum undersize of 15 percent on all sizes. OPA quality standards fix maximum allowable ash content of 15 percent for all sizes. Maximum allowable prices on substandard coal are to be $1 less than OPA ceilings on domestic sizes, 80c. less on pea, 60c. less on buckwheat, and 50c. less on rice.

•

Coal Preparation Interests Europe

Introduction of new developments in coal-preparation techniques in both Europe and America, through the exchange of engineering experience accumulated during the years of comparative isolation because of the war, is forecast by C. H. J. Patterson, director of engineering for the McNally-Pittsburg Mfg. Corp., who has just returned from a tour of Dutch, Belgian and English coal centers.

While in Europe, Mr. Patterson investigated several new processes and improvements that have been put into operation there. He found English coal experts intensely interested in American developments, and at the invitation of the British Colliery Owners' Research Association addressed its members at a special forum at the Royal School of Mines, London.

•

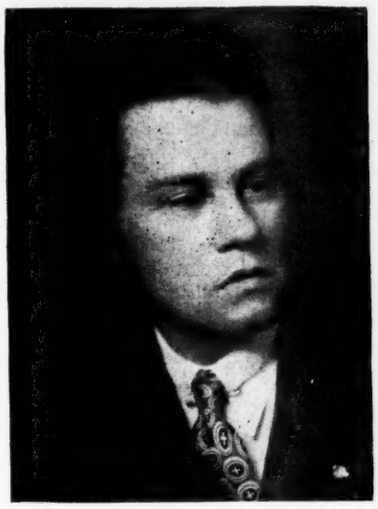
Stanbury and McNeal Join Coal Age Staff

W. A. Stanbury Jr., whose name appears on Coal Age's masthead for the first time this month, joined the magazine's editorial staff March 1 after more than three and a half years' active duty with the Naval Reserve. In the last few months of his naval service, with the rank of lieutenant commander, he held the editorial billet in Project Electra, an outfit assigned to research and



W. A. Stanbury Jr.

development in aerial navigation under the Chief of Naval Operations. Prior to being commissioned in the Naval Reserve Mr. Stanbury was in college work and did public information writing in the Carolinas. His alma mater is Duke University, where he finished undergraduate work in 1931 and graduate work in 1934. In addition to other editorial work, Mr. Stanbury will specialize in features dealing with economic, merchandising, utilization and labor-relations problems.



W. H. McNeal.

W. H. McNeal, who, prior to a hitch in the Army, was engaged in research and promotion for *Coal Age* and its companion mining magazine, *Engineering and Mining Journal*, has rejoined the unit as assistant editor of *Coal Age*. Mr. McNeal was graduated from Dartmouth College in 1935, taking a position with National Advertising Service, Inc., publishers' representatives. He joined McGraw-Hill in 1941 as manager of research and promotion for the company's mining publications. His army career covered 27 months in active service, including 21 months in England and Europe. Mr. McNeal will function as assistant to the editor in administration and production.

•

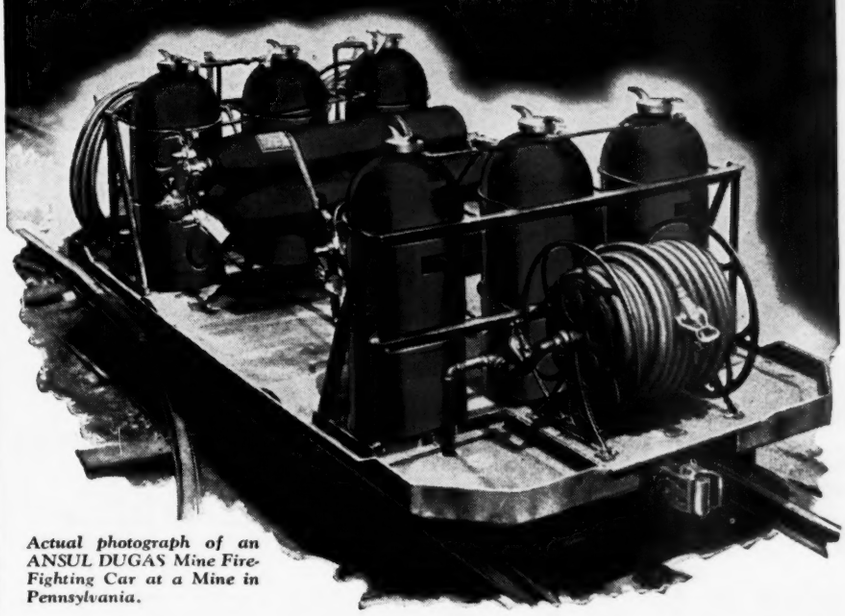
$401,000 Allocated For Bituminous Study

Directors of Bituminous Coal Research, Inc., national research agency for the bituminous coal industry, recently approved a current budget that calls for investing $401,000 in more than 40 research projects intended to improve utilization of solid fuels by railroads, industry and domestic consumers.

In announcing its present program, which is an expansion as well as a continuation of the research begun last year, B.C.R. reported that 240 coal companies and associations, representing 221,000,000 tons of annual production, have pledged support of the investigational and developmental work. Additional contributions from coal-carrying

AN ANSUL PRODUCT
duGas
THE MASTER OF FLAME

MINE FIRE-FIGHTING CAR



Actual photograph of an ANSUL DUGAS Mine Fire-Fighting Car at a Mine in Pennsylvania.

STOP FIRE *FASTER*
WITH DUGAS DRY CHEMICAL

ANSUL presents the first completely equipped Mine Fire-Fighting Car to quickly stop mine fires. An ANSUL Car made a run four miles into a mine in Pennsylvania to fight a fire which had a 35-minute start towards becoming a disastrous mine inferno. The fire was quickly extinguished by use of only one-half the dry chemical charge.

Completely self-contained, the ANSUL DUGAS Mine Fire-Fighting Car can be rushed to any part of the mine where needed. Upon striking fire, DUGAS dry chemical instantaneously releases 1,100 times its volume in flame-smothering gas that chokes off fire in seconds; and the non-toxic gas is released only in the flame area. DUGAS dry chemical is non-corrosive, non-abrasive and will not conduct electricity.

SPECIFICATIONS

Mounted on a standard mine car chassis. Equipped with two, interconnected, 300 lb. tanks of DUGAS Dry Chemical with 100 ft. of hose and one 300 lb. tank of dry chemical with a 50 ft. hose. Three nitrogen cylinders provide pressure. 100 gal. of water may be used through 100 ft. of hose equipped with a combination nozzle to provide either straight stream or spray. Pressure for expelling the water is obtained from an additional nitrogen cylinder.

The dry chemical extinguishing equipment on this car is a modification of DUGAS Large Wheeled Extinguishers which are listed and approved by Underwriters' Laboratories and Factory Mutual Laboratories.

SEND FOR BULLETIN No. 821

Install DUGAS Extinguishers at These Hazard Spots

- Maintenance and Repair Shops above and below ground.
- Electrical Equipment in Tipple, Cable Room, Haulage Ways.

ANSUL CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN

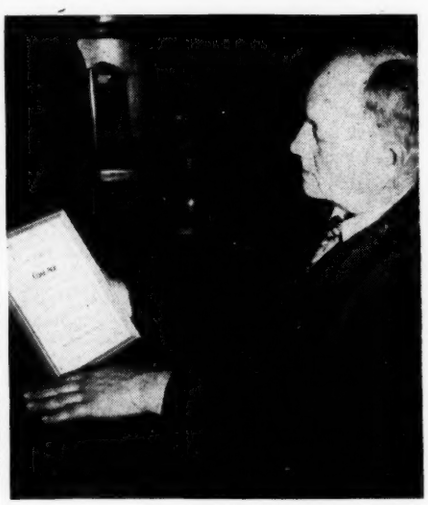
railroads bring the yearly production supporting B.C.R. to nearly 240 million tons.

More than one-half of the current B.C.R. budget covers projects under way and to be started this year at Battelle Memorial Institute, Columbus, Ohio, and include fully automatic stokers, smokeless stoves, furnaces, ranges and water heaters, group heating, and chimney design and construction, all in the residential heating field; railroad coal uses, such as air supply, overfire steam-air jets, effect of fuel on locomotive performance and handling railroad coal; industrial steam and non-steam uses, gasification of coal and coal drying and preparation.

Bituminous Coal Research's Locomotive Development Committee has previously announced projects under way or authorized at various institutions and universities, the goal of which is a coal-fired gas turbine to provide motive power for railroad engines and representing an allocation of funds in addition to the current budget just announced. Locomotive development projects are administered from Baltimore, Md., by John I. Yellott, director of research for this committee.

•

Charter Subscriber Still Active in Mining



Arthur W. Plumlee, Cambria, Ill., has been active in coal mining for 43 years, and for almost 35 of those years, ever since its first issue, *Coal Age* is happy to report, he has been a regular reader. Prior to its initial issue, in October, 1911, *Coal Age* solicited "Charter Subscribers" among men interested in the industry, and awarded such subscribers a special certificate. Mr. Plumlee still has his framed copy of the certificate and gladly shows it to visitors, as pictured in the above illustration.

Beginning his mining career in 1903, Mr. Plumlee was employed by the Robert Dick Coal Co. for ten years, the last four of which he was mine manager. After sale of this property and closing of the mine, he worked twelve years as a machine runner and face boss for the Madison Coal Corp.

SPACE CRAMPED



but easy to ventilate with "VENTUBE"

LOW ROOF working areas needn't cramp output in your mine. For with Du Pont's flexible, synthetic-rubberized duct on the job, men can work more efficiently. "Ventube"* directs fresh, cool air to the men working up at the face.

Today, more and more operators include "Ventube" as part of their standard auxiliary ventilating equipment. They find that "Ventube" has these outstanding advantages:

"VENTUBE" costs less to install in the beginning than rigid tubing systems.

"VENTUBE" is light in weight, compact. One man can carry 100 feet.

"VENTUBE" is flexible, bends around corners, takes up less space in openings, and is easily extended as the face advances.

"VENTUBE" suspended on wire passes over and above obstacles, moving men and machinery.

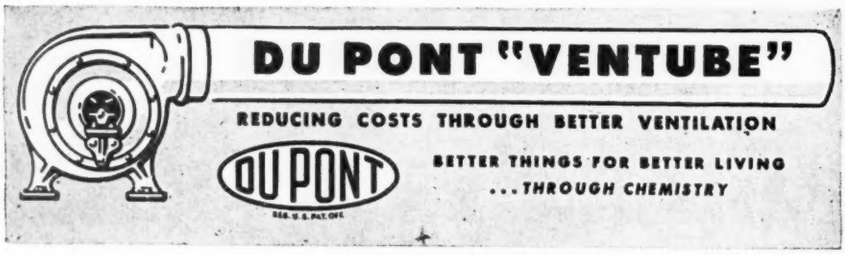
"VENTUBE" clears the face quickly, reduces "down time" after blasting, speeds the entire production cycle.

"VENTUBE" is easy to pack and store for installation elsewhere.

For safety and efficiency, operators observe all local mine regulations governing the installation and use of "Ventube." The blower must have a permissible motor and adequate air capacity. The area should be checked for presence of gases before the blower is turned on. This precaution should always be observed. If power fails, turn off the blower switch. Then the blower can't go on automatically before the area is checked.

For further details, or consultation with Du Pont Technical Service, just write E. I. du Pont de Nemours & Co. (Inc.), Fabrics Division, Fairfield, Conn.

*"VENTUBE" *is Du Pont's registered trade mark for its flexible, synthetic-rubberized ventilating duct.*



From 1924 to 1934, Mr. Plumlee was a district Illinois State mine inspector, and from that time until 1944 he operated truck mines of his own.

For the last 30 years Mr. Plumlee has taught the principles of coal mining under the supervision of the Illinois State Board of Vocational Education, helping coal miners qualify in examinations for coal-mining certificates. More than 1,000 men have studied under Mr. Plumlee, and he is still teaching.

Now 65 years of age, Mr. Plumlee has not yet planned retirement. He says he still reads *Coal Age* and depends on it to keep him informed of progress in the coal industry.

Coal Age would be glad to know of other charter subscribers, active or retired, who are still regular readers.

•

Fire Razes Repplier Breaker

The breaker of the Repplier Coal Co., St. Clair, Pa., was destroyed by fire on March 10. Consuming 1,000 tons of coal in addition, the fire caused damage estimated at nearly $500,000. Six hundred men were employed at the mine, which had a daily output of 2,000 tons. Plans are being made to ship the run-of-mine to an adjacent mine for preparation.

•

Anthracite Meeting Planned at Lehigh

The fifth Anthracite Conference of Lehigh University will be held in Bethlehem on Thursday and Friday, Sept. 12-13, after being twice postponed because of wartime conditions and the convention ban. As there have been few technical meetings since the last Lehigh Conference, May, 1941, the coming meeting is expected to release much valuable information on anthracite.

•

"Big Inch" Sought For Natural Gas

An offer of $40,000,000 by the Transcontinental Gas Pipe Line Co., of Longview, Texas, for the "Big Inch," "Little Inch," and "Southwest Emergency" pipelines built by the government to move gasoline and oil during the war was reported on March 18 by the Federal Power Commission. Transcontinental proposes to spend another $40,000,000 to convert the lines to transportation of Texas natural gas to Pennsylvania, New Jersey and New York. The War Assets Corp., to which the application was made, stated that the offer was one of several now under consideration.

Transcontinental also is reported to have made an alternative application, in case it is unable to buy these pipelines, to con-



Both are good . . . but ONE is better!

TWO THOROUGHBREDS, nip and tuck most of the race . . . then, one pounds down the home stretch to win the purse by a length. Little differences in stamina, heart and training make the *big* difference between a consistent winner and a runner-up.

ROCHESTER WIRE ROPES are "consistent winners" on the job . . . because they're engineered to be not "just as good," but better . . . in performance, wear and safety.

EXTRA VALUE, demonstrated by extra performance, is built in by the Rochester "4-M" formula... (1) the best materials available . . . (2) the most efficient machinery . . . (3) modern methods of straightline production . . . and (4) men who are specialists in every step of wire rope fabrication . . . which assures an unsurpassed product! . . . Now all types, sizes, grades and constructions—preformed or standard—are available for immediate shipment.



LOCKED-IN LUBRICATION is forced by air pressure between individual wires. This process requires twice as much lubricant as is absorbed by other methods . . . protects against internal friction caused by rope passing over sheaves . . . assures longer life and better service from wire ropes made by Rochester.

ROCHESTER *Ropes*

CULPEPER, VIRGINIA

Rochester Ropes' engineers can advise you on your special problems of wire rope selection, use and maintenance. Inquiries invited.

Manganese Steel Dippers *Cut Costs in Stripping and Loading*

Amsco manganese steel "stream-line" welded-type dippers offer important advantages for coal stripping and loading operations.

They unite shock-resistant strength and long wearing life with relatively light weight; a combination of characteristics made possible by the use of "The toughest steel known" and carefully planned design.

R-784 illustrates the design. The lip and teeth have the contour and arrangement to effect easy penetration and full loading.

Austenitic manganese steel work-hardens under impact, increasing the resistance of the metal to abrasive wear; and the exposed surfaces take on a "plowshare" polish which assures clean-dumping.

Amsco welded dippers are moderately priced and are low in ultimate cost, as they outlast dippers of ordinary metal by a wide margin—in either tonnage handled or length of service.

An Amsco welded dipper is shown (in A-515) on a Thew-Lorain shovel loading coal at an Illinois strip mine.

Amsco builds manganese steel dippers for all strip mining requirements as well as a complete line of manganese steel power shovel and dragline parts. Bulletin 743-M describes all of the uses for austenitic manganese steel in mines and quarries.





AMSCO

Foundries at
Chicago Heights, Ill.; New Castle, Del.;
Denver, Colo.; Oakland, Calif.;
Los Angeles, Calif.; St. Louis, Mo.
Offices In Principal Cities

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS • ILLINOIS

AMERICAN Brake Shoe COMPANY

struct two Texas-to-New Jersey lines at a cost totaling $160,000,000. They would extend 1,340 miles, terminating at Linden, N. J., and each would be a 26-in. pipe costing $80,000,000. The company was reported as stating that it held option for the purchase of 200,000 cu.ft. of natural gas daily and was negotiating for options on the purchase of additional gas.

•

Mining Engineer Cited for Army Work



Charles W. Kurtz, chief, Plans Section, Solid Fuels Branch, Fuels and Lubricants Division, Office of the Quartermaster General, is presented with the Meritorious Civilian Service Emblem by Brigadier General Howard L. Peckham, chief, Fuels and Lubricants Division, Office of the Quartermaster General, in recognition of his "significant contribution to the preparation of the comprehensive War Department manuals . . . for initial rehabilitation and operation of mines in occupied and liberated areas." A mining engineer in Pennsylvania coal mining for 35 years, Mr. Kurtz was employed by the Koppers Coal Division of the Eastern Gas and Fuel Associates, Pittsburgh, Pa., prior to his entry into government service.

•

C. H. Lambur Joins Standard Ore & Alloys

Charles H. Lambur has resigned as assistant editor of *Coal Age* to join the staff of Standard Ore & Alloys Co., 120 Wall St., New York, as mining engineer assistant to the vice president, effective April 8. Mr. Lambur, who came to *Coal Age* from the Sahara Coal Co. in 1939, was called to service as a lieutenant in 1941. His service overseas included England, Africa, Pantelleria, Sicily, Sardinia, Corsica, Italy and France, in the course of which he rose to chief engineer for the Twelfth Air Force Service Command with the rank of major. He rejoined *Coal Age* Nov. 1, 1945.

Union Favors Increased Production

Members of Local 1167, U.M.W.A., employed at the No. 6 colliery of the Susquehanna Collieries Co., at a recent meeting adopted a formal resolution calling for a greater response to the appeal for increased production.

President of the local is Stanley Salve; Barney Shiffka, John Butchkoski, Marcel Sokolnicki, Ambrose Gasewicz and Victor Mesavage comprise the committee.

•

Ceilings Raised On Industrial Oil

In a step to encourage production of industrial fuels, the OPA, on March 18, increased ceiling prices for residual fuel oils by one-half cent a gallon, or 21c. a barrel. The increase took effect in all areas except Washington, Oregon, California, Nevada and Arizona, and Hawaii, where the rise will amount to 15c. a barrel. While granted to refiners, the increase is expected to be passed along to consumers, who are primarily industrial users, the Navy and the War Shipping Administration.

At the same time the OPA announced that the temporary increase of one-half cent a gallon authorized earlier this winter in the ceilings of kerosene and lighter distillate oils used by householders will be continued indefinitely. The increases had been scheduled for removal on April 30 in the East Coast, Gulf Coast, and Middle West areas, and on June 30 for the Pacific Coast region. The half-cent increase in domestic grade fuels also was extended to other states that previously had not been affected, making the increase nationwide.

•

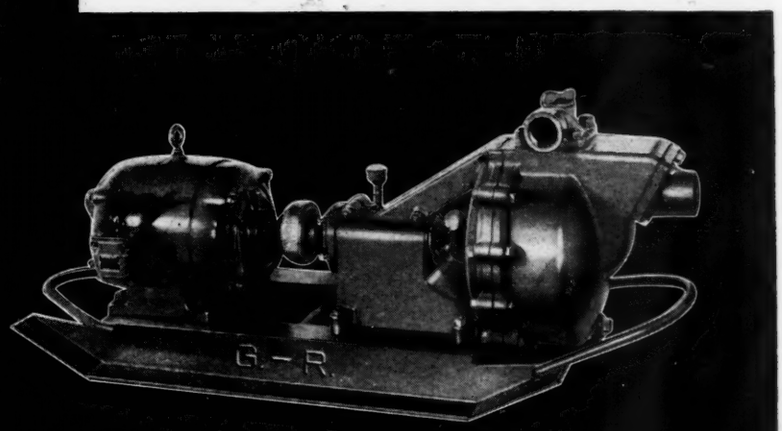
Bluefield Show Plans Large Display

Sponsors of the Eighth Annual Southern Appalachian Industrial Exhibit, to be held in Bluefield, W. Va. on Aug. 22-24, report that manufacturers are manifesting unusual interest and enthusiasm in this year's exhibit, despite their backlog of orders.

"Apparently they are anxious to have the public see the marvelous developments that have taken place in the mine equipment field since the last show in 1941," said Lewis Tierney, Bluefield coal operator and general chairman of the exhibit committee, in explaining the avalanche of requests for space in the 1946 exhibit. The fact that the American Mining Congress has not revived its Cincinnati show this year also has whetted interest in the Bluefield show and added to its importance, Mr. Tierney said.

The exhibit is sponsored by the Pocahontas Electrical and Mechanical Institute, the Pocahontas Operators Association, and equipment and supply distributors of the Bluefield area. B. B. Housman will again be its director.

GORMAN-RUPP MAKES AUTOMATIC PUMPING *Mean Something!*



Automatic or remote control of gathering pumps is still no more reliable than the pump, itself. Gorman-Rupp self-priming centrifugals are the simplest, most rugged pumps ever offered for this service. With a throw of the switch you can start the water -- and know it has started!

No attention is ever required in priming or going from "prime" to "run". These pumps automatically self prime without fail, even though the suction line be completely dry at the time. No external controls or by-passes are used. It's right in the design of the pump.

Muck, sand, coal dust, or solids that will pass the intake strainer will go through without clogging or harming the pump and will not accumulate in the pump body.

If continued pumping of abrasive materials finally requires replacement of the impeller, it is easily reached and the repair quickly made by an unskilled man with common tools.

For the kind of automatic pumping that can be trusted, install Gorman-Rupp pumps. Special information has been prepared for mine applications. Write for a copy today.

THE GORMAN-RUPP COMPANY

306 BOWMAN STREET, MANSFIELD, OHIO

Distributed by: The Bittenbender Company, Scranton, Penna. — Henszey Company, Watertown, Wisc. — Hoe Supply Company, Christopher, Ill. — Industrial Supply Co., Terre Haute, Ind. — Guyan Machinery Co., Logan, W. Va. — Weinman Pump & Supply Co., Pittsburgh, Penna. — Central Supply Co., Greenville, Ky. — Hendrie & Bolthoff Mfg. & Supply Company, Denver, Col. — McComb Supply Company, Harlan, Ky. — Ebbert & Kirkman, Inc., Birmingham, Ala. — John T. Lees, Scranton, Penna. — Ladel Machinery & Conveyor Co., New Philadelphia, Ohio — Union Supply Co., Denver, Col.

FOR SAFER, MORE ECONOMICAL MAINTENANCE IN MINES

...SPECIFY "CZC"-TREATED TIMBERS AND TIES



NO NEED to worry about accidents and replacements resulting from decay-weakened wood in *your* mine if all the timbers and ties have been treated with "CZC." Du Pont Chromated Zinc Chloride gives wood additional long life—safeguards it against decay, gives it measurable resistance to fire.

Maintenance costs are lowered, accidents are reduced, and costly delays caused by replacements of ties and timbers are lessened—wherever "CZC"-treated wood is used.

Write today for complete information on wood preservation for mines. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Del.

DU PONT CZC

Chromated Zinc Chloride

WOOD PRESERVATIVE

DU PONT REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER ...THROUGH CHEMISTRY

Kentucky Passes New Mine-Safety Bill

Unanimous approval of a greatly improved mine-safety law by the Kentucky Assembly on March 14 offered miners increased protection and an expected lowering of fatality rates.

The new law calls for mandatory rock-dusting, increase of the State inspection force from eight to 25 inspectors, requirements for improved ventilation, and an increase in the budget of the Department of Mines and Minerals from $150,000 to $200,000. Stricken from the bill was a provision calling for the Governor to appoint three mine operators and three mine workers to an advisory board to supervise administration of the law.

•

NLRB Allows Foremen Unionization

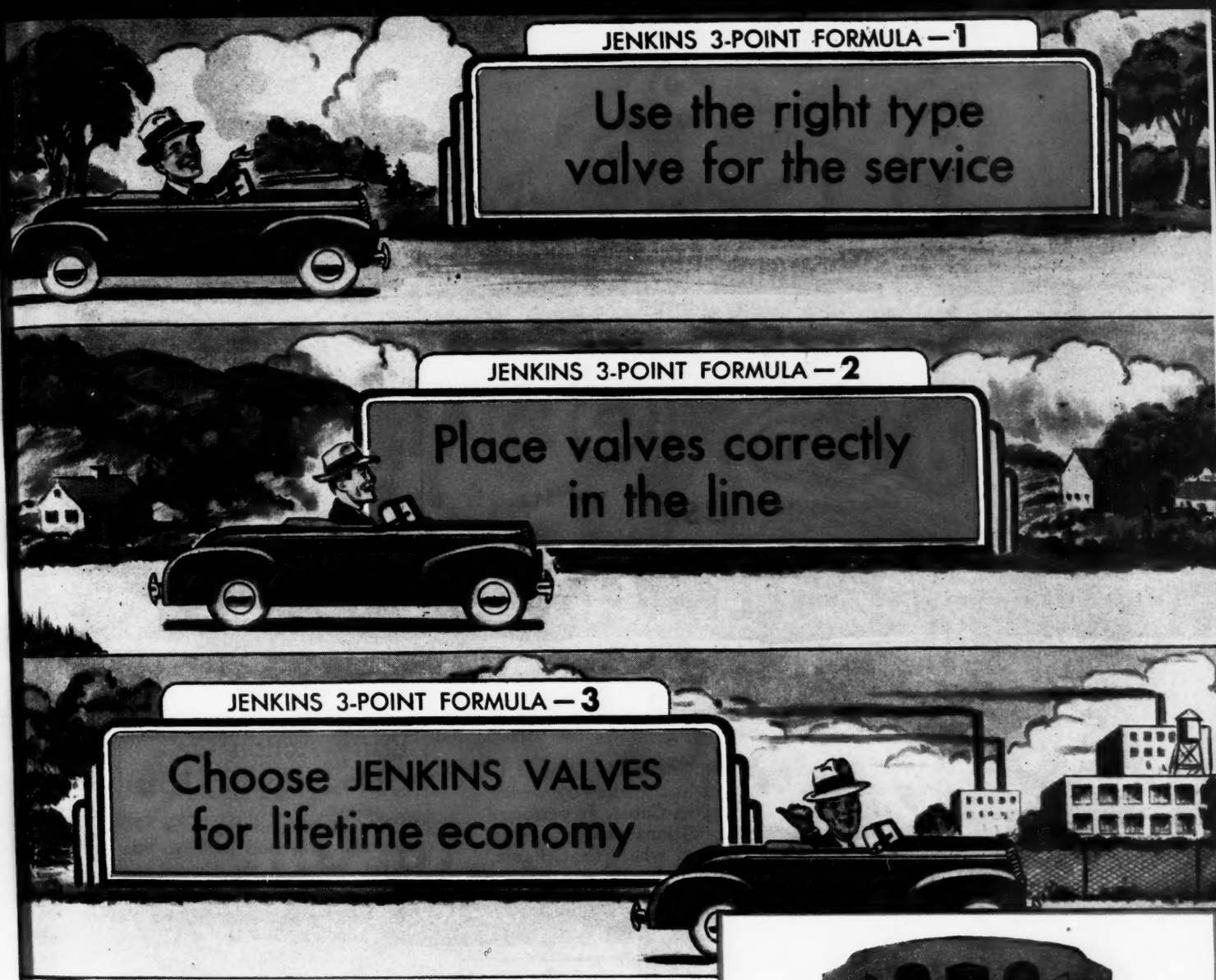
Unionization of coal-mine foremen was approved by a two-to-one ruling by the National Labor Relations Board March 7 in a case involving the Jones & Laughlin Steel Corp.'s Vesta mines and the United Clerical, Technical and Supervisory Employees Union of the Mining Industry, Division of District 50, United Mine Workers of America (AFL). The case came to the board on the union's petition to conduct an election after the company refused to grant collective-bargaining recognition. An election was ordered by the NLRB decision.

The NLRB until then had declared its position only with respect to supervisory employees who sought bargaining recognition only through organizations unaffiliated with unions of rank-and-file employees. This decision is an extension of the doctrine that organizations of supervisors are appropriate collective-bargaining units.

Operators, however, are expected to continue their resistance to Mr. Lewis' demand for enrollment of the foremen as long as the possibility of a court reversal of the NLRB policy exists.

The supervisors of the production and maintenance employees and the supervisors of the clerical and technical employees are separated into two units and will vote in separate elections. In grouping employees eligible for bargaining, the ruling stated: "We find that the following units of employees of the company's Vesta mines No. 4, 5, and 6, the Shannopin mine, and the general mine office at California, Pa., are appropriate for purposes of collective bargaining within the meaning of Section 9 (b) of the act:

"1. All supervisors of production and maintenance employees, including firebosses, mine-crew foremen, assistant mine foremen, maintenance bosses, mechanical bosses, and assistant general master mechanic, but excluding supervisors of clerical and technical



The right road to lower valve costs . . .

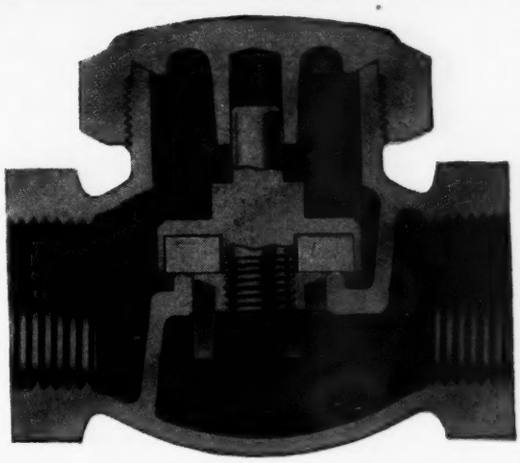
When you follow the Jenkins 3-Point Formula, you can be sure you're headed for new savings in valve expense.

First comes careful selection of pattern and metal. While *many* types *may* be used in a given service, ordinarily there is only *one* type *best* suited to withstand the service conditions and require least maintenance.

Next comes correct installation. Both *where* and *how* a valve is installed can limit or extend its service life, according to the valve "know-how" applied. Write for Booklet No. 944 on installation.

Third, by choosing Jenkins Valves, you not only get valves made with *extra* endurance that means *extra* economy. You also get the experienced advice of top-rated valve specialists, Jenkins Engineers, whenever you need it, on any question of selection or placement.

Base your valve buying on the 3-Point Formula, and make sure of the *extra* value that means *lowest cost in the long run.*



Jenkins Fig. 117-A Bronze Lift Check Valve

Made with a renewable composition disc, Fig. 117-A is dependable choice for drop-tight closure, economical maintenance, and, long, trouble-free service. The disc can be replaced quickly and easily without removing the valve from the line. For pressures up to 150 lbs. steam, 200 lbs. O.W.G.

ONE OF OVER 600 EXTRA *VALUE* VALVES MADE BY JENKINS *VALVE SPECIALISTS*

JENKINS VALVES

REG. U.S. PAT. OFF. TRADE JENKINS MARK Jenkins Bros

LOOK FOR THIS FAMOUS DIAMOND MARK

SINCE 1864 • THE MARK OF TRUSTWORTHY VALVES

BRONZE • IRON • STEEL • CORROSION-RESISTING ALLOYS . . . 125 TO 600 LBS. PRESSURE . . . OVER 600 PATTERNS FOR EVERY INDUSTRIAL ENGINEERING MARINE SERVICE

WHERE OPERATION IS SEVERE!



USE

G-E DELTABESTON APPARATUS CABLE

You can prevent frequent cable failures in mine locomotives, cutters and loaders by wiring with Deltabeston Apparatus Cable. It performs reliably in the severe conditions encountered in coal pits and other locations where heat, flame, moisture, grease and other destructive agents are prevalent.

FIVE REASONS WHY

1. **DELTABESTON APPARATUS CABLE has small, soft copper strands which provide maximum flexibility and withstand excessive vibration.**
2. **DELTABESTON APPARATUS CABLE is thoroughly impregnated with felted asbestos for protection against overload heat.**
3. **DELTABESTON APPARATUS CABLE is insulated with varnished cambric which forms an added barrier against moisture and gives higher dielectric strength.**
4. **DELTABESTON APPARATUS CABLE has a second layer of felted asbestos for extra protection against high ambient temperatures.**
5. **DELTABESTON APPARATUS CABLE has an over-all covering of braided asbestos which resists intense heat, moisture, oil, grease and most corrosive vapors.**

For additional information write Section Y461-10, Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn. Deltabeston Wires and Cables are distributed nationally by Graybar Electric Co., G-E Supply Corporation and other G-E Merchandise Distributors.

GENERAL ELECTRIC

employees, mine foremen, general assistant mine foremen, tipple foremen, general master mechanic, mine superintendents, general superintendent, assistant general superintendents, director of labor industrial relations, safety director, chief engineer, chief of police, weighmasters, weighmasters' clerks, training supervisor, safety inspector, dispatchers, and filter operators.

"2. All supervisors of clerical and technical employees, including engineer, chief draftsman, transitmen, chief supplies clerk, assistant chief clerk at California office, and chief mine clerks, but excluding all supervisors of production and maintenance employees, general master mechanic, assistant general master mechanic, mine superintendents, general superintendent, assistant general superintendents, director of industrial relations, safety director, chief engineer, chief clerk at California office, chief of police, mine foremen, general assistant mine foremen, weighmasters, weighmasters' clerks, training supervisor, safety inspectors, dispatchers and filter operators."

•

Early Action On Ohio Stripping Possible

A possibility that legislation to control strip mining in Ohio might go before the special session of the General Assembly Governor Lausche is expected to call after the May primaries was reported early in March. Although Aug. 1 was set as the deadline for completion of the report of the Strip Mine Study Commission, it was regarded as likely that the recommendations would be ready much earlier than that.

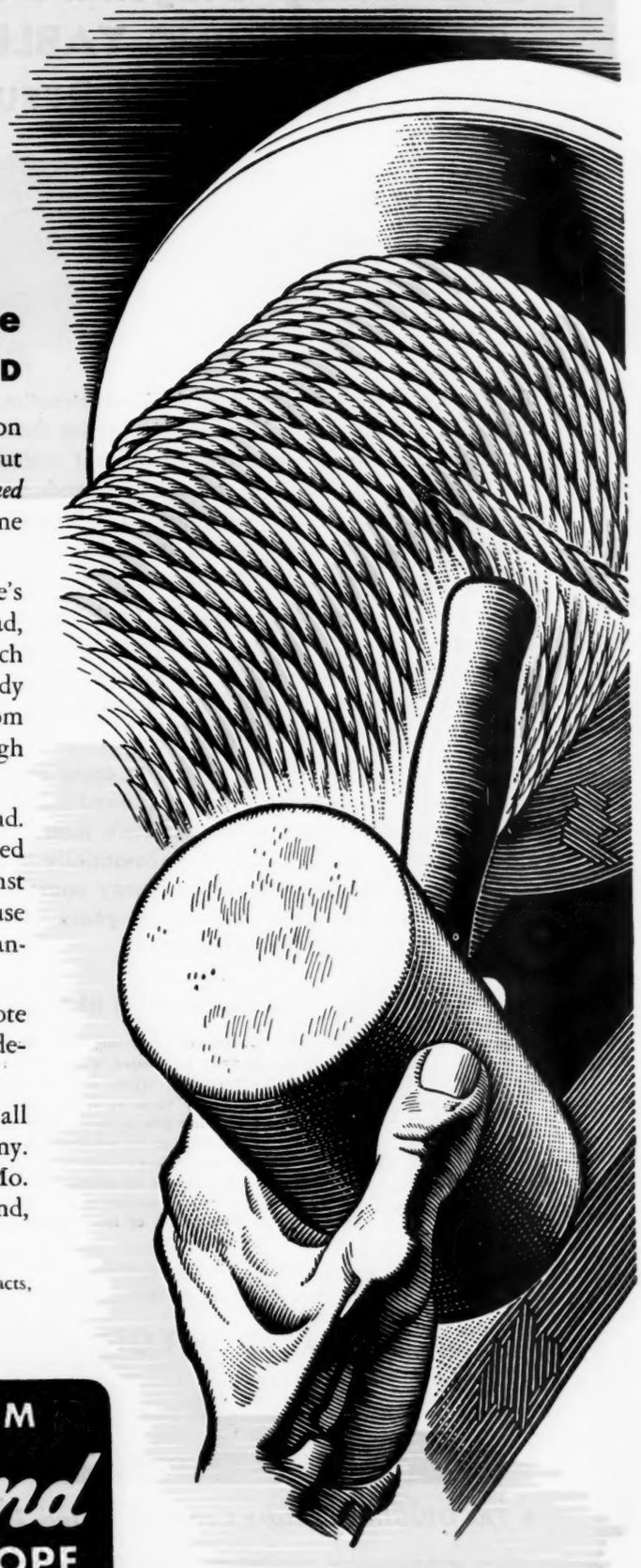
A subcommittee named to draft a preliminary report for the commission's approval expected to have it ready by April 1. The subcommittee is composed of Richard A. Lindermann, Delphos lawyer, who was named to the commission by Governor Lausche; State Sen. Clingen Jackson, Youngstown Democrat, and Rep. Clifton Caryl, Republican, of Marysville.

The commission wound up its two-day deliberations with a conference with Governor Lausche. "The commission members were unanimous in the opinion that there should be legislation which would cope with the problem by compulsion," Governor Lausche said. This unanimity, the Governor stated, included Mr. Lindermann, who earlier had issued a statement opposing immediate legislation.

In his statement, Mr. Lindermann suggested that the commission recommend "that until such time as the results of the experimental work now being carried on by the U. S. Forestry Department, the State Forestry Department and the Ohio Reclamation Association is completed and the results thereof made available, no strip-mine legislation be initiated."

On March 20, the Ohio Reclamation

Uniformity here aids production . . .



EVEN SPOOLING

comes naturally to flexible *PREFORMED* YELLOW STRAND

A wire rope that winds tightly and evenly on the drum helps equipment work at capacity. But you might wonder—if you didn't know *Preformed* Yellow Strand—how any line could overcome some common obstacles to good spooling.

The drum itself may be too small. Often there's erratic alignment . . . too much speed for the load, whether light or heavy . . . excessive slack. Such faults can bedevil an unpreformed rope—already burdened by unruliness—into pulling away from the adjoining wrap, climbing back over the high layer or crisscrossing at will.

Not so with limber *Preformed* Yellow Strand. By preshaping wires and strands we've relaxed internal stresses and improved the defense against *external* bends. The line spools uniformly because it takes *naturally* to drum grooves and the channels between rope coils.

The same smooth-running qualities promote sheave efficiency. Slippage and abrasive wear decline. Both rope and parts last longer.

Specify *Preformed* Yellow Strand by name. Get all you should in wire rope performance and economy. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* New York, Chicago, Houston, Portland, Seattle. *Factories:* St. Louis, Seattle, Peoria.

HAND BOOK FREE: "Wire Rope for Mining" contains useful facts, tables, pictures. Write for your copy.

BRODERICK & BASCOM
Yellow Strand
PREFORMED WIRE ROPE

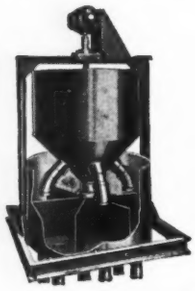
SuperDuty Diagonal Deck
COAL WASHING TABLES
LOSE LESS COAL IN REFUSE



Due to its exclusive *diagonal deck* construction, the SuperDuty Table loses less coal in refuse than any other machine or process on the market while producing an equal or better washed coal product. This is demonstrated by the fact that SuperDuty Tables are successfully used in several installations to clean up the refuse from other processes.

On top of this, SuperDuty *Diagonal Deck* Tables have a greater capacity than rectangular tables of equal size, and you know why SuperDuty Tables are standard equipment at leading collieries and in the majority of reclamation installations.

Further, exceptionally low operating costs and savings on maintenance are actually proved for you by the uniform experience of SuperDuty's many users. SuperDuty Tables operate at substantially 1 H.P. under continuous operation, and sturdy construction keeps repairs negligible for added years of hard service. Write today for full details.



Concenco Feed Distributors

The Concenco Revolving Feed Distributor is a heavily fabricated, all steel machine, built in various types, with motor drive requiring only ¼ to ¾ H.P. in operation. This distributor effects perfectly a splitting of feed sluiced to its revolving cone, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of coal washing tables, giving an equal distribution of feed to each table.

THE DEISTER ★
CONCENTRATOR
COMPANY
909 Glasgow Ave. • Fort Wayne, Ind., U.S.A.

CONCENCO PRODUCTS

★ The ORIGINAL Deister Company ★ Inc. 1906

Association began its spring planting of approximately 1,250,000 trees on 1,378 acres. "As many or more acres of strip-mined land will be reclaimed this year than were stripped in 1945," Allen R. Davidson, president of the association, said, "although we did not secure as many trees as we had commitments for from the various coal companies in our membership."

•

More Natural-Gas Lines Proposed

The Tennessee Gas & Transmission Co. has filed with the Federal Power Commission an application to construct and operate increased main-line facilities that would boost its capacity by 117,000,000 cu.ft. daily, equivalent to more than 2,000,000 tons of coal annually. The cost would total about $30,000,000 and involve 400 miles of 26-inch pipeline.

Several other new applications for the increase of natural-gas facilities were made during the past month. Delivery of an additional 50,000,000 cu.ft. daily to Cincinnati was asked of the Federal Power Commission by the Cincinnati Gas Transportation Co. In Chicago, hearings on additional deliveries to the Chicago market, which began in January, were resumed on March 4.

A proposal also has been made by the Mid-Continent Gas Transportation Co. for the erection of a 400-mile 26-in. main pipeline from Liberal, Kan., to Kansas City, Mo. Initial delivery is planned at 190,000,000 cu.ft. per day.

Expansion of gas markets in northern New York is called for in an application filed by the Central New York Power Corp. for authority to serve straight natural gas to Syracuse, Watertown and Utica. The gas would be purchased from the New York State Natural Gas Corp.

Cheaper gas for Chicago was authorized by the Federal Power Commission in approval of new rate schedules filed by the Natural Gas Pipeline Co. of America, of Chicago. A refund of $2,334,319 to ultimate consumers for past service is provided for, and the cost of natural gas to eleven distribution companies will be reduced by $687,955 annually.

•

Culmerville Tipple Damaged by Fire

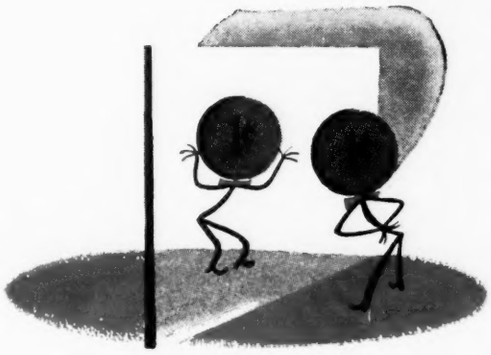
The 200-ton-per-hour tipple of Mutual No. 3 mine of the Culmerville Coal Co., Tarentum, Pa., was destroyed on March 24 by a fire that caused an estimated $100,000 damage. Firemen battled the blaze for ten hours and saved the mine and other buildings. George Batcher, company president, expects to begin rebuilding as soon as materials can be obtained.



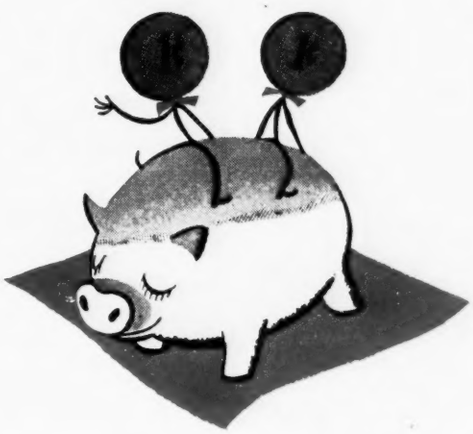
***The very best** oil takes less than 2¢ out of every operating-cost dollar . . . but look what 2¢ can do!*



***1. Keep pistons,** valves, rings and other vital parts cleaner by removing hard carbon.*



***2. Keep a tough,** heat-absorbing, pressure-absorbing film between moving parts.**



***3. — and so** give you substantial savings* in down-time, maintenance and repair costs!*

*Prove it in your own equipment

Macmillan Ring-Free motor oil IS different. Because it IS a better oil, we invite you to test it against any other brand. We'll gladly help you arrange a dollars-and-cents test in your own equipment. Write, wire or phone the nearest Macmillan office. MACMILLAN PETROLEUM CORPORATION. 50 W. 50th St., New York 20 • 624 S. Michigan Avenue, Chicago 5 530 W. Sixth St., Los Angeles 14.

ASK FOR MACMILLAN OIL

THE LOW-MAINTENANCE OIL

HIGH, HIGH FILM STRENGTH! LOW, LOW ENGINE DEPOSITS! CLEANS AS IT LUBRICATES!

Here it is



Find Out About This REVOLUTIONARY NEW PIPE COUPLING

The Last Word in Speed, Simplicity and Economy of Pipe Connection for Your Trade

Mining engineers will welcome the news about Naylor's new Wedge-Lock couplings illustrated and described in the Naylor Catalog just off the press. These connections revolutionize pipe coupling . . . save time, work and money. A hammer is the only tool required to assemble or disassemble them.

Write for your copy of the new Naylor Catalog today

NAYLOR LOCKSEAM SPIRALWELD PIPE

NAYLOR PIPE COMPANY
1268 EAST 92nd STREET, CHICAGO 19, ILL.
New York Office:
350 Madison Ave., New York 17, N. Y.

U.S.B.M. Names Explosives Chief

Dr. Bernard Lewis, an authority on explosives, propellants and combustion, and whose wartime research activities won him the Legion of Merit, has been promoted to the post of chief of the Explosives Division of the Bureau of Mines, according to an announcement by R. R. Sayers, director of the bureau. As a major and subsequently a lieutenant colonel in the Army Ordnance Department, Dr. Lewis directed research and development laboratories that produced scores of improvements in artillery shells, grenades and fuses.

Dr. Lewis, after receiving degrees from the Massachusetts Institute of Technology, Harvard University and Cambridge University in England, entered the Bureau of Mines in 1929 as a physical chemist at Pittsburgh, Pa., where he again will be stationed at the Bureau's Central Experiment Station. Before being commissioned in the Army he had become widely known for his research, his writing in scientific journals, and his lectures before scientific societies of the United States, England and Germany.

•

Inspection Standards To Be Revised

Federal coal-mine inspection standards, last revised in July, 1945, are now being studied for further revisions, according to officials of the Health and Safety Branch of the U. S. Bureau of Mines. Changes are necessitated both by improvements in mining techniques and because many current standards were only a result of war-time operation. The new standards are expected to be available in two to three months.

•

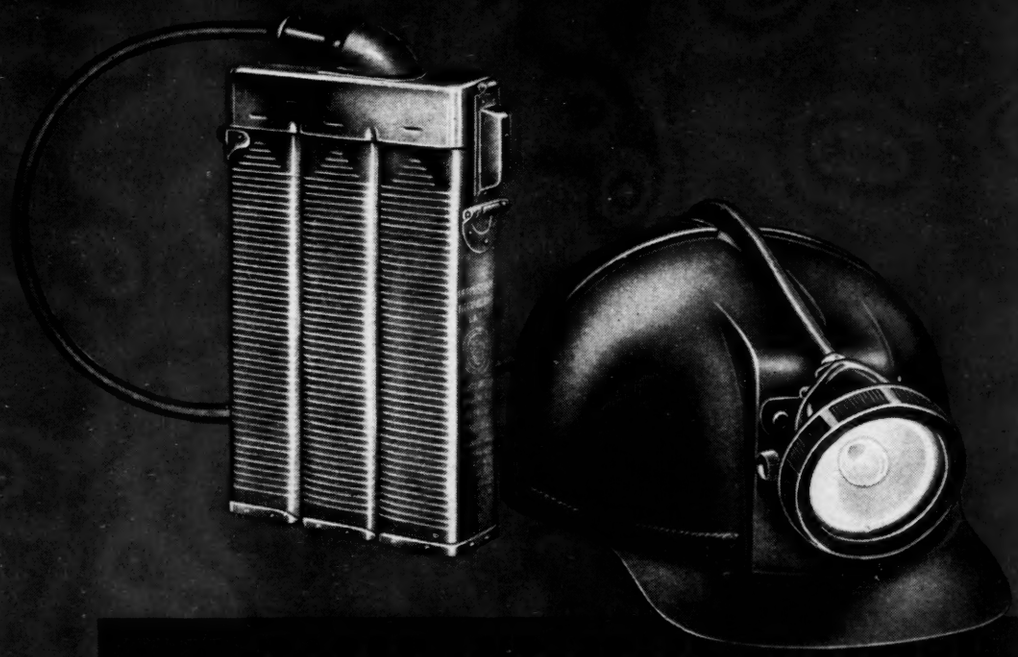
Chinese Mines Resume Operation

The war-damaged coal mines in the Tzechuan and Poshan basins, near Tsinan, China, have been put back into partial operation, according to reports from the McGraw-Hill World News Bureau. In the Tzechuan sector, 150 mines operated jointly by the workers and the government employ 5,000 miners and are producing approximately 1,000 tons daily.

At Tsaochwang, in southern Shantung, the Chungking coal mine, one of the largest in the Far East, will resume operations soon as a result of an agreement between Communists and Nationalists brought about by General Marshall. The mine, alternately held by troops of the two factions, had a daily output of 3,000 tons last year.

The urgent need for increased coal production in connection with China's rehabilitation program has intensified efforts to obtain badly needed mine equipment, either as reparations, war surplus or imports. Such imports from Japan by the end of February included 374,658 mine timbers, 150,000 electric detonators, and 800 cases of industrial dynamite.

PERFORMANCE



BASED ON SOLID QUALITY

EDISON
ELECTRIC CAP LAMPS

M·S·A
COMFO CAPS

Quality, in design and construction, extends through every detail of these famous mine safety products and accounts for their unrivalled serviceability under rugged mining conditions.

•The unique Edison Lamp gives more effective light and complete dependability. The *high-pressure molded* laminated bakelite of M.S.A. Comfo Caps typifies its all-around head protection.

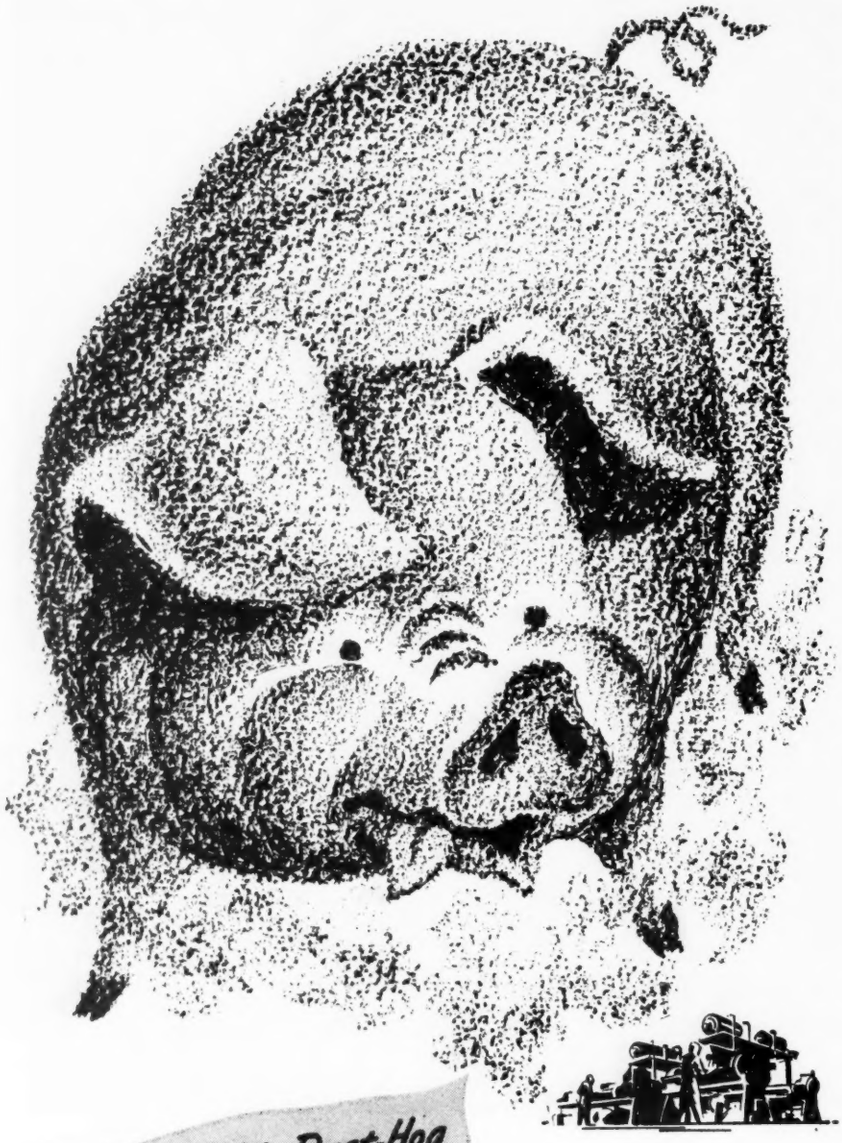
•Through and through, you get the "extras" of quality, for extra performance that pays extra dividends on your safety investment!

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS AND MEADE STREETS PITTSBURGH 8, PA.
District Representatives in Principal Cities

In Canada, MINE SAFETY APPLIANCES COMPANY OF CANADA, Ltd., Toronto . . . Montreal . . . Calgary . . . New Glasgow, N. S.

SOUTH AMERICAN HEADQUARTERS
Casilla 733, Lima . . . Agents in Principal Cities

MINE SAFETY APPLIANCES CO. (S.A.) (PTY) LTD.
Johannesburg, South Africa N'Dola—Northern Rhodesia



Like bad air, poor light and obsolete tools . . . Dust-Hog keeps a man from doing all he might. Dust . . . in his eyes . . . dimming his light . . . begriming his work . . . slows him down, invites mistakes, spoils morale.

Consider the money dust control saves — improving efficiency, reducing maintenance, reclaiming dust by-products. Pangborn's free booklet, "Control of Industrial Dust", brings you up to date on how to clear out costly "dust pockets".

Write Pangborn — *world's largest manufacturer of dust control and blast cleaning equipment.*

Pangborn
PAT. OFF.

PANGBORN CORPORATION, HAGERSTOWN, MARYLAND

Personal Notes

ALBERT BROWN, acting electrical engineer for the Philadelphia & Reading Coal & Iron Co. since June, 1945, has been appointed electrical engineer of the company. A graduate of Lafayette College, Mr. Brown joined P. & R. in 1927 as electrical engineer of the Pottsville division. From 1932 to 1944 he served as chief electrician at the St. Nicholas Central Breaker, and in October, 1944, was named assistant electrical engineer of the company.

HENRY W. LOWE, recently released from active duty in the Army as a major, has been appointed supervisor of employment and training for the Island Creek Coal Co., Holden, W. Va. Previous to entering the service in 1942, Mr. Lowe was for several years director of personnel of the Carnegie-Illinois Steel Corp. in Charleston.

GEORGE J. LEAHY, vice president of the Hickory Grove Coal Mining Co. and of the Mariah Hill Super Block Coal Co., has been elected president of the Litchfield & Madison R.R. Mr. Leahy also is executive vice president of the Republic Coal & Coke Co., Chicago, and will continue in that position.

EDWARD FOX, Pottsville, has been elected president of the Shen-Penn Production Co., a subsidiary of the Philadelphia & Reading Coal & Iron Co., recently organized to undertake stripping operations for P. & R. in the Shenandoah area. R. E. Taggart, P. & R. president, was elected chairman of the board. Other P. & R. officials, elected to the board of directors of Shen-Penn include: M. P. McDermott and Walter P. Bloecher, Philadelphia; and G. A. Roos, Pottsville.

ROBERT L. LLEWELLYN, formerly a designing engineer for Island Creek Coal Co., Holden, W. Va., has become preparation engineer for the Valley Camp Coal Co., Elm Grove, W. Va.

GEORGE C. CAIN has been transferred from Mine No. 32 to Mine No. 63, Consolidation Coal Co., as mine foreman, vice Mike Smith, transferred. Virgil Mackey has been promoted to assistant mine foreman at Mine No. 32, and Delmo Knight to assistant mine foreman at Mine No. 63, according to an announcement by W. L. Doolittle, vice president, Consolidation Coal Co., Fairmont, W. Va.

EDMUND N. GORMAN, recently released from the Air Transport Command with the rank of lieutenant colonel after service in Europe, has been elected president of the Cumberland Coal Co., Baltimore, operating in Tucker County, W. Va. In assuming Cumberland's presidency he follows in the footsteps of both his father and grandfather.

HAROLD B. WICKEY, chief of the Mining Branch of the Metals and Minerals Division, CPA, has left government service to join Consolidation Coal Co., Fairmont, W. Va., in an engineering capacity. He served in the Mining Division of WPB almost from the outset, first as technical analyst on coal-mine priorities and later as assistant chief of the division's Coal Section until it was



In the Spotlight!

Outstanding performance always wins recognition and acceptance... In the field of Wire Rope, "HERCULES" (Red-Strand) long ago won its place "In The Spotlight" because of its uniform reliability and economy in every industry that calls for "heavy duty" action.

You won't go wrong when you adopt the Red-Strand as your buying guide for wire rope. As "HERCULES" is furnished in both Round Strand and Flattened Strand construction, and in either the Preformed or Non-Preformed type—you are assured of adaptability as well as of high quality.

Ask our Engineering Department to recommend the type and construction best suited to your needs.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS
5909 KENNERLY AVENUE

ESTABLISHED 1857
ST. LOUIS 12, MISSOURI, U. S. A.

NEW YORK 6 . . . 90 West Street
CHICAGO 7 . . 810 W. Washington Blvd.
DENVER 2 . . . 1554 Wazee Street

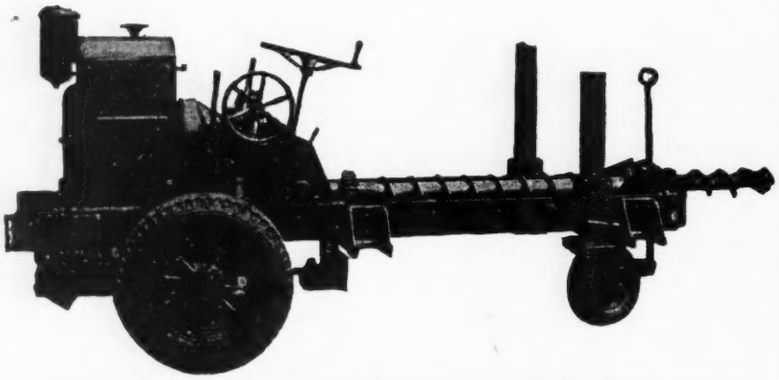
"HERCULES" (RED-STRAND) WIRE ROPE

SAN FRANCISCO 7 . . 520 Fourth Street
PORTLAND 9 . . 914 N. W. 14th Avenue
SEATTLE 4 . . . 3410 First Avenue South

PARMANCO Horizontal Drills

"Positive Control Drilling"

Parmanco Horizontal Drills give you "Positive Control Drilling." Parmanco Vertical and Horizontal Drills, are today's leaders in low cost, low maintenance drilling—All Parmanco Drills are equipped with patented Parmanco augers. Used by leading strip mine operators—Write us your drilling problems.



PARIS MANUFACTURING CO.

PARIS, ILLINOIS

succeeded by the CPA. Harold Montag, also a veteran of the Mining Branch staff, who has been handling mining machinery priorities, succeeds Mr. Wickey as chief of the Mining Branch of the Metals and Minerals Division of the CPA.

R. F. Donaldson, superintendent of the strip mine operated by the Solar Mining Co. near Rushville, Ill., has been transferred by the company to Kentucky to open a new mine there. Lewis Barco, recently returned from service in the U. S. Navy, has been named as superintendent of Solar's Rushville mine.

P. R. Paulick has been appointed general manager of the Hellier Coal & Coke Co., Hellier, Pike County, Ky. He will continue his practice as consulting mechanization engineer, however, and is slated to make two trips to Nova Scotia during 1946 in this connection.

A. C. Dittrick has been appointed preparation engineer for the Kentucky coal properties of the Consolidation Coal Co., with headquarters at Jenkins, Ky. Prior to this appointment Mr. Dittrick was assistant general manager of W. H. Warner & Co., Cleveland, and previously for a number of years was preparation engineer for Hanna Coal Co., St. Clairsville, Ohio. R. L. Blake, formerly maintenance foreman for Consolidation Coal Co., at Mine No. 207, Jenkins, Ky., has been named superintendent of that company's central preparation plant for mines in the Elkhorn field. Consolidation has also announced that Everett Mullins has been promoted to maintenance foreman at Mine No. 204, Jenkins, Ky., and that Russell M. McDonough has been promoted to maintenance foreman at Mine No. 207.

W. B. Bannister has been appointed superintendent in charge of all stripping operations for the Pittsburgh Coal Co.

Charles Klink has been appointed superintendent in charge of the Lindley mine of the Pittsburgh Coal Co., Canonsburg, Pa. Charles Stevenson has been promoted to mine foreman at the same mine.

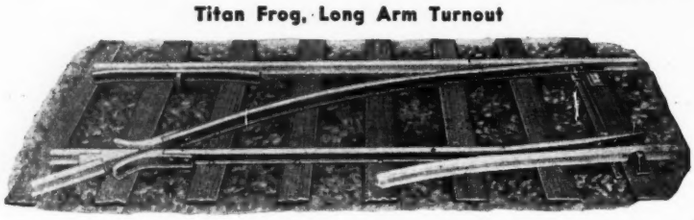
L. H. Winger has resigned as supervisor of employment and training for the Island Creek Coal Co. to become maintenance foreman at Mine 98 of the Consolidation Coal Co., Bingamon, W. Va. Before joining Island Creek in 1941 he had been employed by the Mining Extension Department of West Virginia University and previous to that had worked in the maintenance department of Consolidation mines in Kentucky, Pennsylvania, Maryland and West Virginia.

Frank B. Dunbar, general manager of the Mather collieries, Pickands, Mather & Co., Mather, Pa., since 1929, has announced his retirement on April 15. He began his mining career as a boy in 1886 and became a superintendent in 1901. He served as general superintendent for the Hillman Coal & Coke Co. from 1921 until joining the Mather organization. Mr. Dunbar is a past

KEEP More COAL ROLLING FASTER with DEPENDABLE FROGS and SWITCHES

WEIR KILBY

Titan Frog, Long Arm Turnout



The Titan Frog is furnished in Titanium or Manganese treated steel. In combination with the proper switches, stands, etc., it is easily installed; used right or left hand; saves joint bars.

Weir products for mine track work include a wide variety of constructions in frogs, switches, guard rails, clamps, stands, etc.

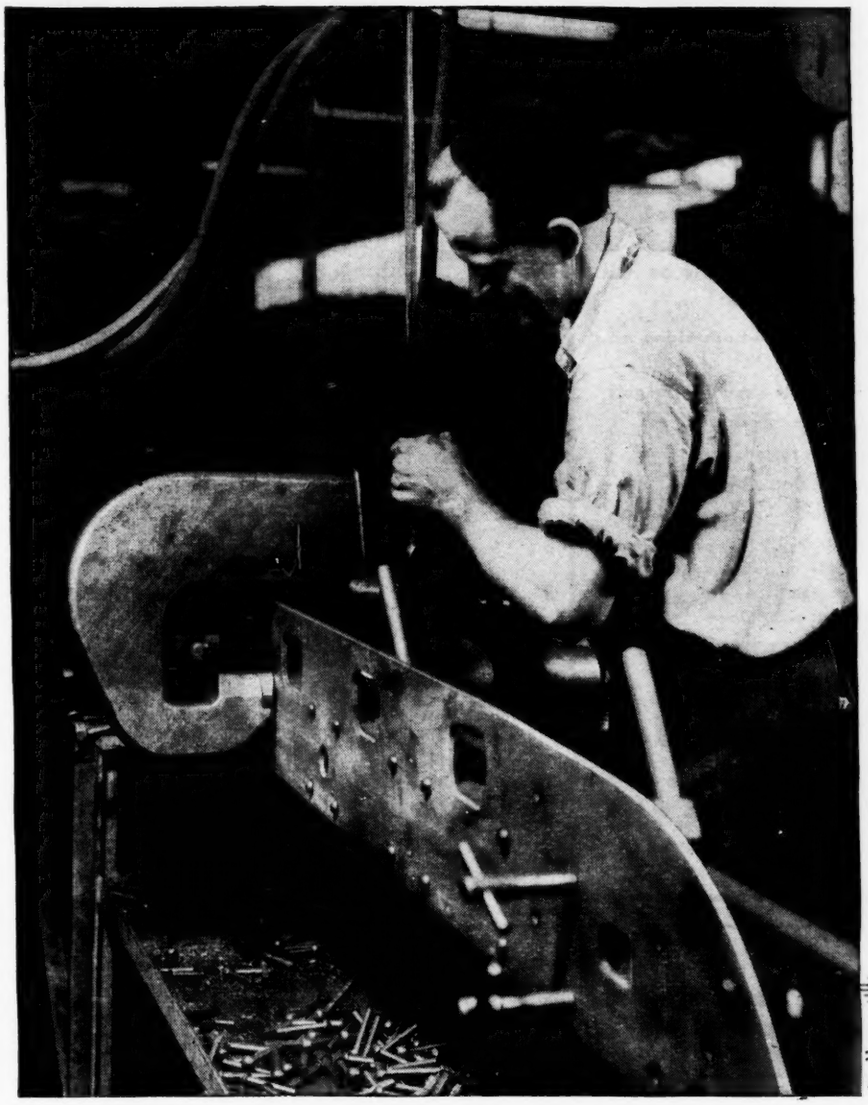


CATALOG "H" comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. A request on your letterhead will bring your copy promptly.

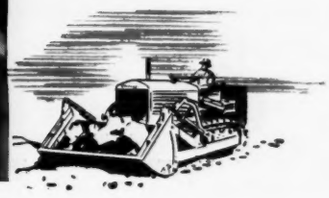
Suppliers to Mines and Railroads Since 1882

WEIR KILBY CORPORATION

CINCINNATI 12, O. BIRMINGHAM 7, ALA.



Added attraction!



To provide greater resistance to shocks, strains and twists of crawler tractor operation, the track frames of Oliver "Cletrac" tractors are reinforced with sections of heavy plate steel . . . an "added attraction" that adds years of dependable service.

Strategically located to provide greatest strength, these steel sections are securely riveted in place by modern hydraulic riveters. This *extra* protection is typical of the many added features that are standard on Oliver "Cletrac" tractors. Through the use of the most modern equipment and production methods, quality is built in... high cost is engineered out.

Maintenance of this standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors . . . for your every need.

CLETRAC THE OLIVER CORPORATION Cletrac

a product of **The OLIVER Corporation**

HOLDS FAST UNDER ROUGHEST CONDITIONS

The oldest insulating tape known, popular for nearly 60 years. Preferred for wrapping-mining-machine and gathering-locomotive cables because it's built to withstand the roughest treatment. Only Ruberoid Insulating Tape has all these 7 features:



1 Double grip—both sides adhesive.
2 Great tensile strength—tough.
3 Won't tear, ravel or pucker.
4 Resists abrasion.
5 Acid- and alkali-proof.
6 Extra thick—one layer insulates.
7 Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength.

RUBEROID

INSULATING TAPE

The RUBEROID Co.
Executive Offices, 500 Fifth Avenue, New York 18, N. Y.

COFFING HOIST CO.

COFFING HOISTS are designed to give sturdy, dependable, efficient, long-time service. They are light-weight, portable hoists and each type has its place in industry, whether it be construction, production, or maintenance work. For complete information see your local supplier or write for our Bulletin Form G4.



"Safety-Pull" Ratchet Lever Hoist



"Quik-Lift" Electric Hoist



Spur Geared Chain Hoist

COFFING HOIST COMPANY
RATCHET LEVER HOISTS - SPUR GEAR HOISTS - ELECTRIC HOISTS
LOAD BINDERS - DIFFERENTIAL HOISTS - TROLLEYS
DANVILLE, ILLINOIS

president of the Coal Mining Institute of America and has been active in numerous other mining, engineering and civic associations. His unusual safety record shows that in 45 years there has never been a fatality because of a mine fire or an explosion at any mine under his supervision.

RUSSELL G. BATEMAN, formerly section foreman, Sonman Shaft mine, Koppers Coal Division, has been appointed superintendent, Brookwood Shaft, Inc., Houtzdale, Pa. Thomas Southern has been appointed foreman, John Lebda promoted to night foreman, and A. C. Tokarcik promoted to section foreman, by the Brookwood Shaft, Inc.

Preparation Facilities

WINTON COAL MINING CO., South Tamaqua, Pa.—Contract closed with Wilmot Engineering Co. for one Type D Wilmot Simplex jig to prepare egg and stove coal; feed capacity, 20 t.p.h. of clean coal.

GLEN ALDEN COAL CO., Kingston, Pa.—Contract closed with Wilmot Engineering Co. for 48-in. Wilmot separators to be installed in Woodward colliery; total feed capacity, 120 t.p.h. of egg coal.

NEW RIVER CO., Cranberry Mine, Mount Hope, W. Va.—Contract closed with Kanawha Mfg. Co. for Kanawha-Belknap calcium chloride washer; capacity, 60 t.p.h. 6x3-in. egg coal.

HEIDELBERG COAL CO., Avoca, Pa.—Contract closed with Deister Concentrator Co. for four SuperDuty Diagonal-Deck No. 7 washing tables to treat Nos. 4 and 5 buckwheat anthracite; also one Concenco revolving feed distributor, Type 102, arranged for four-way split to distribute feed to four SuperDuty tables.

HOOVER COAL CO., Cressona, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck No. 7 washing table to clean No. 4 buckwheat.

EAGLE HILL COAL CO., St. Clair, Pa.—Contract closed with Deister Concentrator Co. for two SuperDuty Diagonal-Deck No. 7 washing tables to clean No. 4 buckwheat and one Concenco revolving feed distributor, Type 102, arranged with four-way split.

CONSOLIDATION COAL CO., Mine 207, Jenkins, Ky.—Contract closed with Fairmont Machinery Co. for washing plant to treat 75 t.p.h. of 0x1/8-in. coal, using ten Deister Concentrator Co. SuperDuty Diagonal-Deck No. 7 washing tables; two Bird Machine Co. centrifugal filters will be furnished to reduce the moisture in the clean coal product; addition to existing plant; probable date of completion, Dec. 1.

BERWIND-WHITE COAL MINING CO., Wilmore, Pa.—Contract closed with Fairmont Machinery Co. for plant having capacity of 650 t.p.h. of mine-run coal; equipment to include mine-run conveyor, shaker screens for loading two sizes and a loading boom on one track; all-steel structure and expected to be in operation Nov. 1.

OSCAR HUMMEL, Sellingrove, Pa.—Contract closed with Deister Concentrator Co. for one SuperDuty Diagonal-Deck washing table to clean barley coal.

HAVE YOU INVESTIGATED CANTRELL AIR COMPRESSOR ECONOMY?



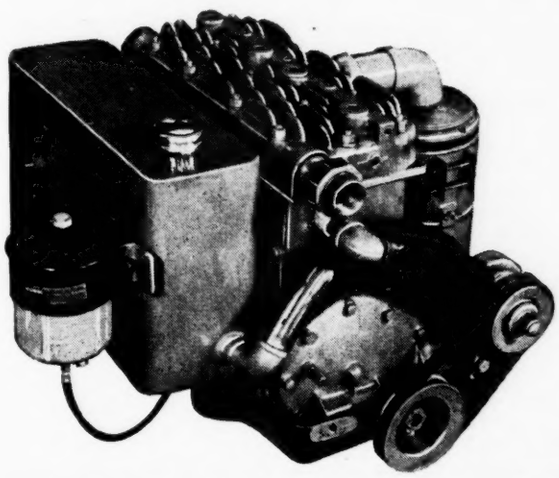
THE CANTRELL "SL" COMPRESSOR

The chances are we can give you the name of a mine close to you using Cantrell Air Compressors where you may see first hand, why Cantrells are preferred for Coal Mining.

A Cantrell means lowest purchase cost . . . lowest maintenance costs. In addition, the Cantrell Factory Rebuilt Compressor Exchange Plan eliminates expensive overhauling of compressors in your own shop. Shown above is the Cantrell "SL" outfit, complete with air receiver and base, shipped to you, ready for installation with your own drive motor, at only $484.51 F.O B. our plant.

The "SL" is designed for stationary use in your shop or for mounting in mine car for transportation to points of service. Drive motor will be supplied, of course, if preferred, at extra cost, making this outfit complete, ready for service upon arrival.

Other Cantrell Compressor Outfits include: the "SP" — self-propelling compressor and 2-ton locomotive combined—two machines in one . . . the "CI" rubber tired for trackless operation . . . the "OMC", track type, for movement to points of service in regular trips of cars. There is a "Cantrell" built to suit your requirements.



★ *Shown above is the popular Cantrell, Type S-101 Compressor, shipped ready for installation with your own base, air receiver and motor, at only $348.00 F.O.B. plant.*

Cantrell COMPRESSORS

IMPERIAL-CANTRELL MFG. CO., JELLICO, TENNESSEE

DRY SAND

will get more coal out faster!

...as produced by PERFECTION CONE STOVE DRIERS



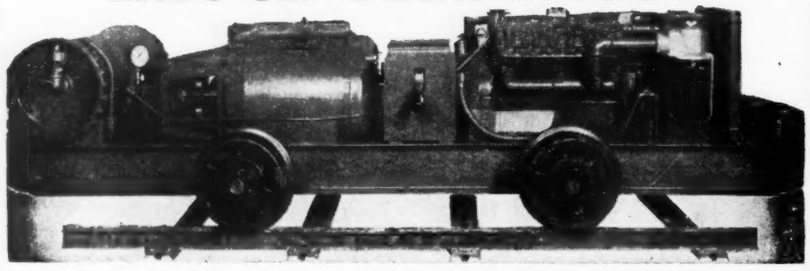
Spinning wheels won't pull heavy loads. It takes sand . . . *dry sand* . . . running freely from locomotive to track to give hard-driving wheels traction and real pulling power!

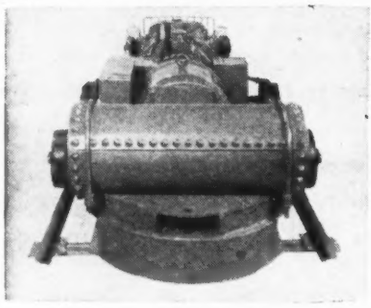
Get dry sand at HALF the usual cost! Use the "PERFECTION" Cone Stove Sand drier. Standard size dries 8 to 10 tons in 8 hours . . . capacity can be increased to 12 to 14 tons. Write for full particulars.

Remember "PERFECTION" It's the best!

PRINCETON
Foundry & Supply Co. Princeton, W. Va.

ACME "LOWBOY" *Mine Car* COMPRESSOR





REAR VIEW OF COMPRESSOR

Above view shows location of air receiver which is A.S.M.E. riveted type. Each end of outfit is provided with coupling for towing.

• A lightweight — compact — low height mine car compressor which delivers 92 cu. ft. of air per minute at 100 lb. pressure. The unit is driven by a 25 HP compound wound motor. Operating speed 1140 R.P.M.—voltage either 230 or 500 D.C.

The Acme "Lowboy" is specifically designed to meet the needs of present day mining especially mechanized properties. Being low in height it is adaptable to both high and low seam operations.

Bulletin No. 3920 gives complete description of unit and its many advantages in modern mining. Write for your copy today.

ACME COMPRESSOR CO.
Williamson, West Virginia

Association Activities

TWELFTH ANNUAL VIRGINIA STATE SAFETY CONFERENCE, to be held at Richmond, Va., on May 23-24, has named Dr. Huston St Clair, president, Jewell Ridge Coal Corp., Tazewell, Va., and Lee Long, coal mining executive of St. Paul, Va., to its executive committee.

ANTHRACITE-OPERATORS ASSOCIATION has elected as president Robert L. Birtley; vice president, Louis J. Pagnotti; treasurer, Bruce Payne; directors-at-large, A. C. Dodson and James H. Pierce.

COAL MINING INSTITUTE OF AMERICA has named Dennis J. Keenan, Pennsylvania State mine inspector for the 15th bituminous district, a director.

COAL MINING SECTION OF THE NATIONAL SAFETY COUNCIL has appointed as a staff representative Herbert E. Risser, recently released from the Army as a major.

Obituary

LOUIS F. QUIGG, executive vice president of the Colorado Fuel & Iron Corp., Denver, Colo., died Feb. 26 in a Colorado Springs hospital of injuries sustained in an automobile accident near Larkspur.

CHARLES E. RALSTON, president of the Benedict Coal Co., Pennington Gap, Va., died Feb. 17 in a Highland (Ky.) hospital after a few weeks' illness. He also had an interest in several operations in the Harlan (Ky.) field and was well known among the industry in both Kentucky and Virginia.

THOMAS P. HILTON, 74, president of the Black Diamond Fuel Co., Boulder, Colo., dropped dead March 13 while on an inspection of coal lands near the Black Diamond mine, west of Lafayette. He had been active in Colorado mining for many years and was widely known throughout the State.

GRANVILLE A. HARVEY JR., 25, chief engineer of the Turkey Gap Coal Co., Dott, W. Va., died March 19 at St. Luke's Hospital, Northfork, W. Va. He had previously been employed by the Crozer Coal & Coke Co. and the Gilliam Coal & Coke Co.

Coal Publications

Washability Characteristics and Washing of Coals From the Matanuska Field of Alaska, by M. R. Geer and H. F. Yancey, U. S. Bureau of Mines. R. I. 3840; 24 pp., 8x10½ in.; paper; mimeograph; free. Coals tested came from the two principal coal producers in the field, the Eska and the Evan Jones mines. Eska coal contains 40 percent of impurity heavier than 1.70 specific gravity; Evan Jones, about half that quantity. Considering all sizes together, a product with 18 to 19 percent ash can be obtained by a separation of the coal at 1.70 specific gravity. Fine coal from these mines can be



The system of accident analysis used by Bituminous Safety Engineers is so thorough it's like putting your mine under a gigantic magnifying glass. This periodic accident analysis includes classifying and charting, to indicate where the most severe accidents occur, the frequency with which they occur, and where production is slowed down the most.

By study, the charts show the hazardous conditions which are influencing the accident pattern and how they may be corrected. Accident analysis is a part of the specialized service which Bituminous gives to the mine owners and operators who carry Bituminous Workmen's Compensation Insurance.

***Security* with service**

BITUMINOUS CASUALTY CORPORATION

ROCK ISLAND ILLINOIS

Assets over $15,000,000

The only help you need to make belt repairs FAST



BRISTOL'S

BELT LACING

for rubber or woven conveyor belts up to 13/16" thick. Order from your distributor.

And write for Bulletin 730.

The BRISTOL Company
MILL SUPPLY DIVISION

139 BRISTOL ROAD, WATERBURY 91, CONN. *Distributors Everywhere*



cleaned to a lower percentage of ash than coarse coal.

Continuous Hydraulic Classification: Constitution of the Teeter Column Throughout Its Depth, by G. D. Coe, I. L. Field, M. F. Williams Jr. and W. H. Coghill, U. S. Bureau of Mines. R. I. 3851; 14 pp., 8x10½ in.; paper; mimeograph; free. (A "teeter column" is a settling pipe in which a co-axial pipe of slightly smaller diameter has been introduced to create a differential resistance to flow, the "teeter" being the part of the column above the contraction.) In any continuously fed hydraulic classifier (with a teeter column having parallel sides), the higher layers in the teeter column were found by the investigators of the Bureau to have higher pulp densities than the lower layers, producing in the teeter a potentially unstable condition. Despite the top-heavy pulp density, smooth, efficient classification can be achieved in continuous operation when teeter columns of small diameter are used. In the tests, anthracite, bituminous coal and iron-ore tailings were subjected to classification.

Sensitivity of Explosives to Initiation by Electrostatic Discharges, by F. W. Brown, D. J. Kusler and F. C. Gibson, U. S. Bureau of Mines. R. I. 3852; 16 pp., 8x10½ in.; paper; mimeograph; free. On the basis of present information, the investigators believe that precautions should be taken to prevent electrostatic charges accumulating on the persons of those who handle such explosives as are likely to be ignited by electrostatic energies of 0.015 of a joule or less. As ungrounded equipment, wiring or structures may acquire much larger energies, precautions always should be taken to prevent charges from accumulating on such items around all operations in which explosives are being used.

Backfilling Problem in the Anthracite Region as It Relates to Conservation of Anthracite and Prevention of Subsidence, by S. H. Ash and James Westfield, U. S. Bureau of Mines. I. C. 7342; 18 pp., 8x10½ in.; paper; mimeograph; free. Federal Government, State and mining companies should study backfilling of anthracite mines comprehensively.

•

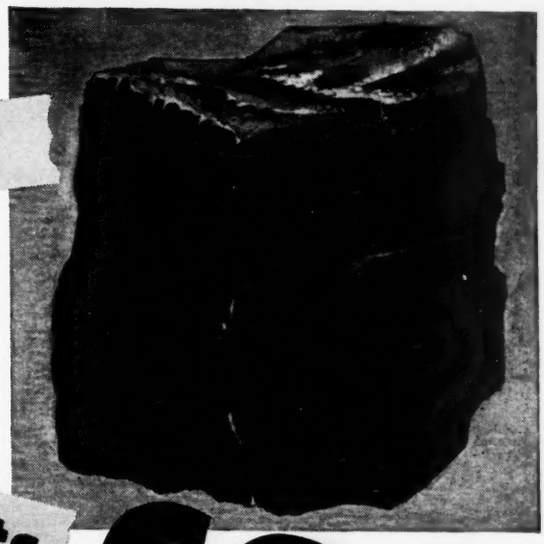
Mining Papers Read At Fairmont Meeting

The first meeting of the year for the Central West Virginia Coal Mining Institute, held in Fairmont, W. Va., March 14, featured technical papers presented by two coal authorities.

George R. Higinbotham, production manager for the Consolidation Coal Co., read a paper entitled "Mechanical Mining in Thick Seams" and in conjunction showed a series of slides. E. F. Miller, general superintendent of the Koppers Coal Co.'s Federal mines, presented a paper entitled "Safe and Efficient Shuttle-Car Operation." General discussion followed the reading of each paper.

Following the program a buffet supper was served. The meeting was filled to capacity and several guests were present.

CALCIUM CHLORIDE



Dustproofs and Protects COAL

1 Makes Coal Clean and Dustless.

2 Keeps coal from freezing in car and pile, in truck and storage bin.

3 Protects both domestic and industrial coal by reducing wind losses, deterioration of grades and protects against spontaneous combustion.

4 It is odorless and easy to apply.

5 Helps to make coal a clean preferred fuel to meet revived postwar competition.

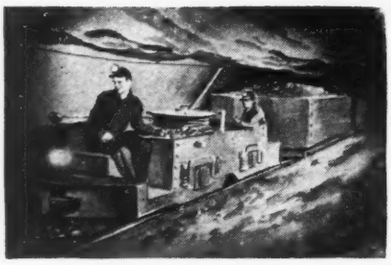
Our Literature Tells How • Please Write for it

CALCIUM CHLORIDE ASSOCIATION
4145 Penobscot Bldg. • Detroit 26, Mich.

CALCIUM CHLORIDE



FREEZEPROOFS AND DUSTPROOFS IN **1** OPERATION



Equipment News

Rectifier

Westinghouse Electric Corp., East Pittsburgh, Pa., offers a newly developed selenium rectifier that can be submerged in boiling water or packed in ice and still turn a.c. and d.c., it is said, at an efficiency equal to that obtained under normal operating conditions. The new unit consists of a heavily tin-plated hermetically sealed container inside which is placed selenium suspended in oil.

Though industrial control devices—transformers, resistors, vacuum tubes, rectifiers and other heat-dissipating apparatus—usually are mounted inside a metal cabinet, resulting in extremely high temperatures that mitigate against good efficiencies and long life for ordinary rectifiers, this new selenium rectifier, it is said, will operate with only a slight drop in current output at a total temperature higher than the boiling point of water and will last much in excess of 1,000 hours.

•

Car Shaker

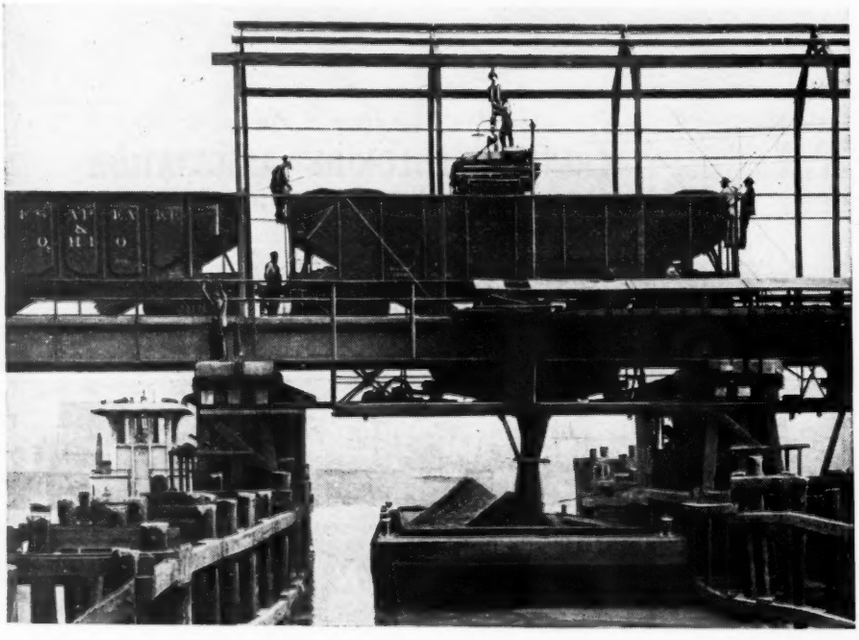
Robins Conveyors, Inc., Passaic, N. J., offers a new machine that, it is said, literally shakes the sticky, stubborn coal out of the railroad cars without even scratching the paint. The car shaker is placed on top of a loaded car and a button is pressed to start an electric motor. Seismic action results and the coal flows out the bottom of the car. About two minutes is the average time, with only two men required for the equipment, in contrast to the old method of unloading, which required four to six men and as much as two hours per car.

•

Fire Extinguisher

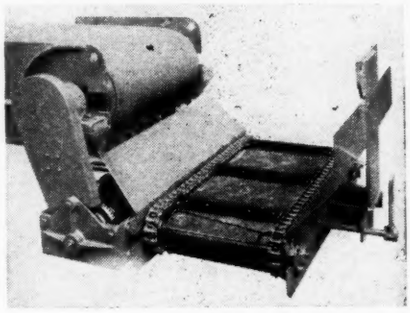
A new All-Out dry-chemical fire extinguisher offered by Pressurelube, Inc., 609 West 134th St., New York 31, is designed so that All-Out dry chemical is ejected, under pressure, in a flat stream that separates the flame from the burning material, forming a dense fire-smothering cloud over the flaming area up to a distance of 18 ft.

Important features emphasized by the manufacturer include: forms no toxic gases; non-conductor of electricity; non-abrasive; easily removed with a brush; squeeze grip nozzle for positive control; lighter weight permits easy carrying and use by men or women operators; chemical will not deteriorate or cake; easily refilled, requiring no special tools or equipment; 26 in. of ½-in. 1D pressure hose permits rapid maneuverability of dry chemical stream; meets requirements of the Associated Factory Mutual Laboratories and Underwriters' Laboratories.



Conveyors

Goodman Mfg. Co., Chicago, offers a new mine-car loading device for use at the ends of belt conveyors under the designation Yo-Yo, a name coined at the mines. It is



a short chain conveyor that is quickly reversed and prevents spillage in loading into cars. It is said to be possible to let the train move slowly by it without even stopping and yet load all of the cars.

•

Electrodes

Metal & Thermit Corp., New York City, offers a new Murex line of heavy-coated aluminum bronze and phosphor bronze electrodes, making available, it is said, a wide range of bronze alloy deposits varying in chemical analyses and in mechanical properties from high tensile strength and ductility with comparatively low hardness to medium strength with zero ductility and relatively high hardness.

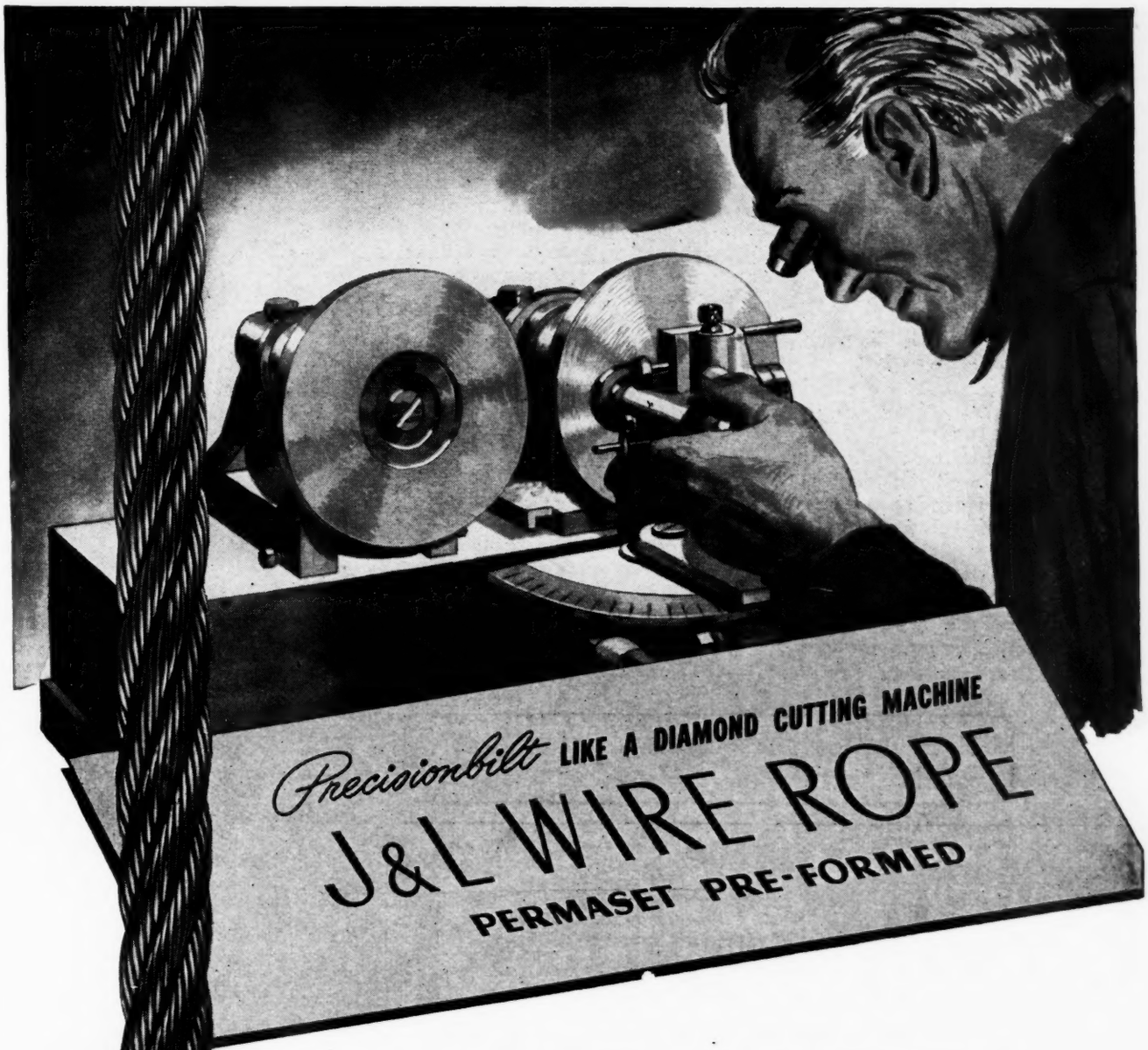
Type AB 12, aluminum bronze—average Brinell hardness of deposit, 120—is a general-purpose electrode providing a high-strength corrosion-resistant deposit with exceptional "hot ductility" or elongation at red heat.

Type AB 16, aluminum bronze—hardness of deposit, 160—combines high ductility and tensile strength with outstanding bearing qualities.

Type AB 20, aluminum bronze—average hardness of deposit, 200—is designed to provide a deposit having the highest possible hardness and tensile strength without sacrificing ductility.

Type AB 25, aluminum bronze—average hardness of deposit, 250—is intended for overlay applications requiring high hardness to withstand extreme wear and heavy pressures.

Type AB 30, aluminum bronze—hardness



Precisionbilt, like a diamond cutting machine, J&L Permaset Pre-formed Wire Rope will give you increased rope life. Just as diamond cutting is done by highly skilled men of long experience, J&L Wire Rope is made by men who have for years produced the best in wire rope.

The long service of J&L Wire Rope on any job reflects the quality of the steel from which it is made—J&L Controlled Quality Steel.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE



Employers are Human, too!

Mr. Employer, do you have your daily operations insured from an employer-employee standpoint?

Workmen's Compensation is necessary, and in most cases compulsory ...then there are individual or group policies for your personnel ... and our new Underground Property Damage policy that protects YOU against loss or damage to all equipment underground—damage to shafts, passageways, retimbering and repairing inside structures—plus damage to property above ground as result of an explosion underground.

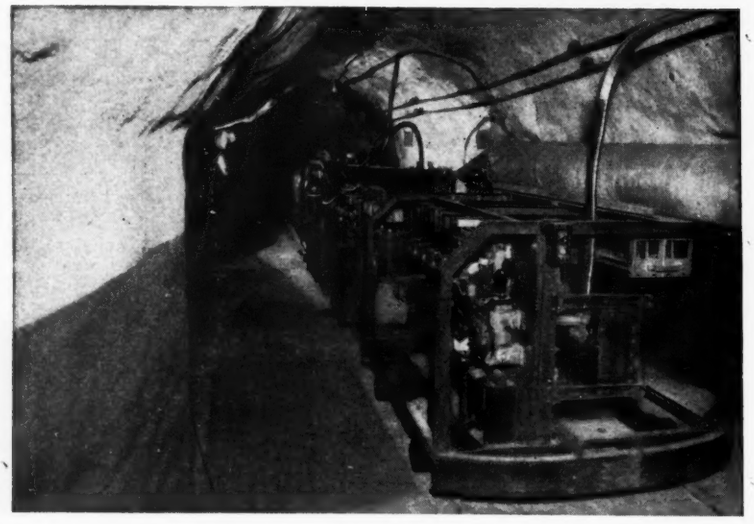
Our Safety Engineers, authorities in their field, offer you suggestions as to the prevention of accidents in your operations.

We are proud of our record of claims service—not only for coal mining companies, but for commercial and industrial organizations, too. From the most serious claims to the smallest ones, we keep in mind the rights of the employer as well as the employee.

For detailed information about these particular policies and others, please write or phone your local insurance agent.

COAL OPERATORS CASUALTY COMPANY
PITTSBURGH 22, PA.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.



Above is an underground substation room which is lined with 2" mesh reinforced "GUNITE". Similar uses of plain and reinforced "GUNITE" in haulways and entries are saving money for many coal mines. We do the work or sell the equipment.

Write Today For Your Free Copy of Our 72-Page Bulletin D-2300

MANUFACTURERS OF THE "CEMENT GUN"

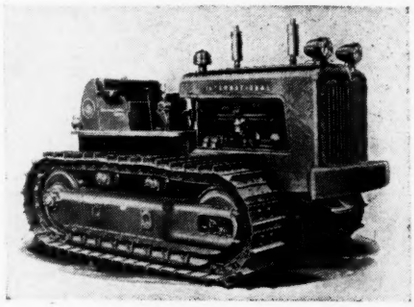
of deposit, 300—provides an extremely hard deposit with good bearing qualities.

Type PB 57—hardness of deposit, 71—is a phosphor-bronze electrode that produces sound, homogeneous welds with tensile strengths of 30,000 p.s.i. or more, depending on the base metal being welded.

•

Crawler Tractor

A new diesel crawler tractor in the 130 drawbar horsepower range, the TD-24, weighing about 35,000 lb., is offered by the International Harvester Co., Chicago. Features of the new unit emphasized by the company include a new type of steering to give the operator easy and positive control

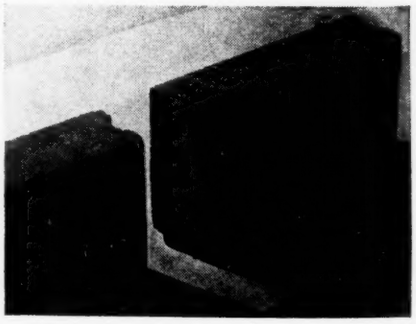


of the tractor; use of special sealing and anti-friction bearings in truck rollers, greatly extending the track roller lubrication period; and convenient mounting for all types of allied equipment. It has eight speeds, from 1.6 to 7.8 m.p.h.

•

Brattice Blocks

Concrete tongue and groove blocks for use in place of wooden brattice in mines are offered by the Belot Concrete Block Co., Tiltonsville, Ohio. The blocks are stacked



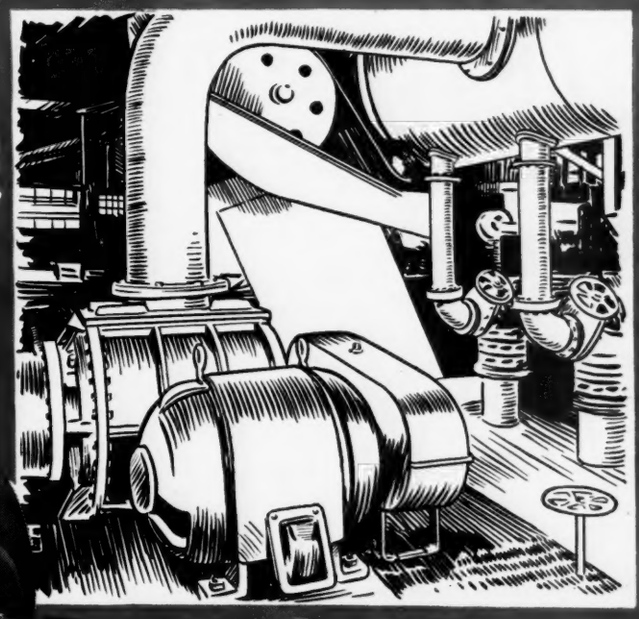
up to form a wall or brattice and do not, it is said, require cementing; they interlock to hold them in position. The blocks, which measure 4x8x16 in., can be re-used many times (90 percent recoverable).

•

Gear Puller

Scott & Ewing Co., Findlay, Ohio, offers the Klay puller, in which the pulling and gripping actions are independent of each other, said to develop greater pulling

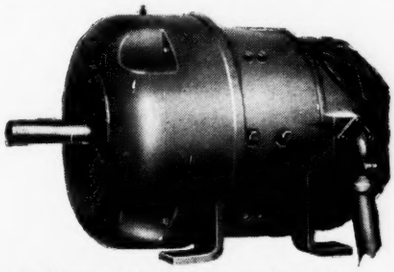
For Preparation Plant Service



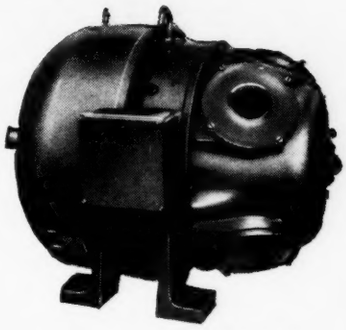


RELIANCE A·C D·C MOTORS

Reliance Series "C" Protected (open type) Squirrel-cage A-c. Motor for use in the preparation plant and for general service.



Reliance Type T Fully-enclosed, Fan-cooled D-c. Mine Motor for use on permissible underground equipment.



Reliance Type T Fully-enclosed, Fan-cooled D-c. Motor for use where permissible equipment is not required.

You will find that there is a right type of Reliance Motor for each of many preparation plant operations and for underground workings.

The experience of Reliance engineers in developing motors for underground loaders, cutters and shuttle cars places them in a position to know the motor characteristics essential to mining conditions. These motors have earned a well-deserved reputation for staying on the job when the going is tough.

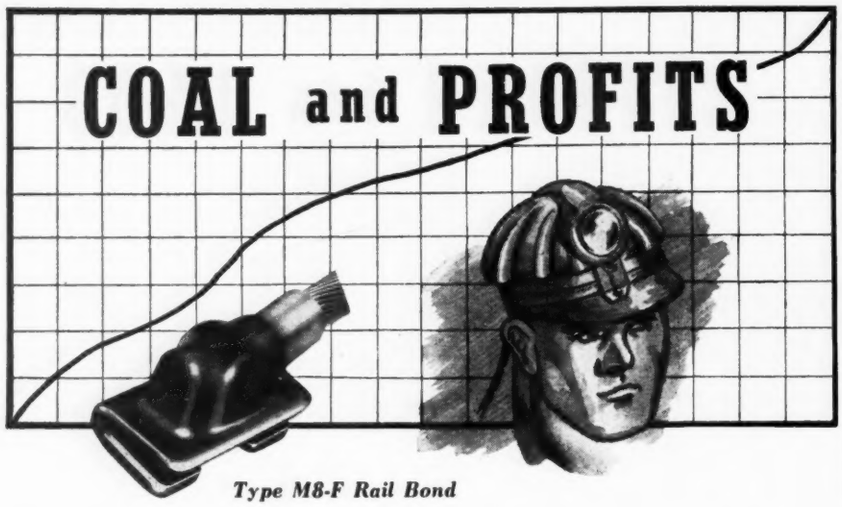
You can look for trouble-free power on your conveyors, washers, screens, pumps and similar preparation plant equipment when driven by Reliance Motors.

Bulletin C-118 tells all about Reliance Series "C" A-c. Motors and their 8 Balanced Design Features. Write for it.

RELIANCE ELECTRIC & ENGINEERING CO.

1055 Ivanhoe Road Cleveland 10, Ohio

Birmingham • Boston • Buffalo • Chicago • Cincinnati • Denver • Detroit • Gary • Greenville
Houston • Kalamazoo • Kansas City • Knoxville • Los Angeles • Milwaukee • Minneapolis
New Orleans • New York • Philadelphia • Pittsburgh • Portland, Ore. • Rockford, Ill.
St. Louis • San Francisco • Seattle • Syracuse • Tampa • Tulsa • Washington, D. C.



Type M8-F Rail Bond

MESCOWELD RAIL BONDS

definitely make their mark on your Profit Sheet. Because of the patented Flashwelding of cable to oversize forged steel head, they provide maximum conductivity, conserve current and increase hauling power. They install easily and rapidly; long service life.

18 TYPES, covering every requirement, comprise the Mescoweld Line. Write for catalog.

IMMEDIATE DELIVERIES

MOSEBACH
Electric & Supply Co.
1115 Arlington Ave., Pittsburgh 3, Pa.

MORE HAULAGE FOR 20% LESS BATTERY CAPACITY

Double knee-action; better trackability. Floating power; less power consumption. Quick acting footbrake — essential for quick stopping, especially behind loading machines. Brake shoes that follow wheels (due to knee-action). Adjustable Timken Bearings throughout.



Huskiest transmission in any storage battery locomotive. Oil-tight; leakproof. Use regular auto oil; change every 6 months. Strong. Simple design. Low maintenance cost. Backed by over 25 years of experience with Storage Battery locomotives.

GREENSBURG "MONITOR"

Franklin County Coal Corporation at Royalton and Herrin, Illinois, have 12 of our Monitor type, storage battery locomotives.

All Greensburg Locomotives are* CUSTOM-BUILT *to your requirements

THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.

FLEXIPIPE
The improved flexible tubing for mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by a more rigid means of face ventilation.

Write for free sample and full information.

BEMIS BRO. BAG CO.
412 Poplar Street, St. Louis 2, Mo.

power plus a safer and more positive grip on the object being pulled. The Klay nut principle, it is said, securely locks the hooks to the gear or wheel so that they will not slip off and the grip is equally applied on all sides, so that the total force developed by the pulling screw is directed toward removing the wheel instead of part of it being diverted into gripping power. These pullers are made in two- and three-hook types for pulling anything from a $\frac{3}{8}$-in. gear up to a 40-in. wheel or hub.

•

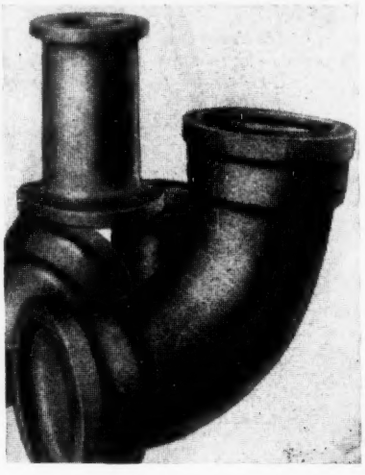
Mine Roof Jack

A new, economical mine roof jack said to be tailored to fit the job is offered by the Duff-Norton Mfg. Co., Pittsburgh, Pa. According to the manufacturer, users need buy only base and top fittings, cutting their own 2-in. pipe for the heights required. Two sizes are available: one, of eight tons capacity, with a raise of 17 in., for use with standard 2-in. pipe; the other, of 16 ton capacity, 17 in. raise, used with double-strength 2-in. pipe. Descriptive bulletin available.

•

Pipe Elbows

Mosebach Electric & Supply Co., 1150 Arlington Ave., Pittsburgh, Pa., offers a new line of non-corrosive pipe elbows for mine drainage use. Made of anti-acid bronze with



high lead composition, they are said to be particularly resistant to mine acid water, exhaustive tests showing unusual protection against acidity. The Mosebach foundry says it is in position to make these castings to any specifications.

•

Brake

A new Series 1,300 magnetic disk brake designed for use on applications up to 100-hp. motor-driven loads is offered by Stearns Magnetic Mfg. Co., Milwaukee 4, to augment its previous Series 800 and 1,000 brakes. The new and larger size Series 1,300 brake can be supplied in either floor or

PROFIT

..IN "CRYSTAL GAZING"



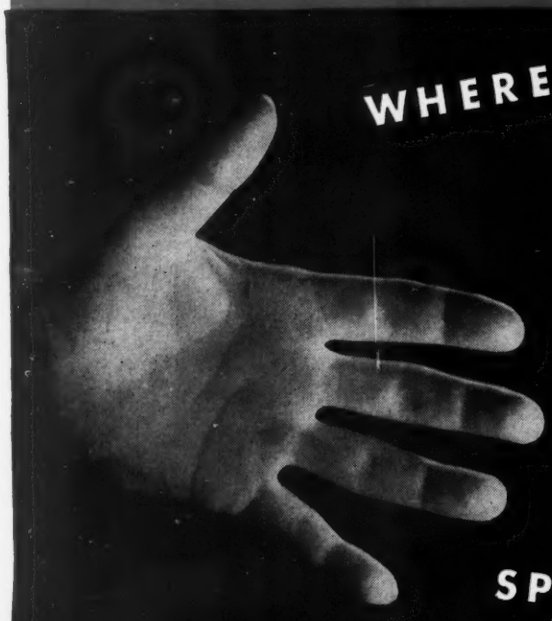
CRYSTAL GAZING has no place in modern coal selling. Profit can be found only in modern methods – seeking exactly the RIGHT markets; the places where your coal will do the BEST job per dollar of delivered cost.

This company, with an adequate sales organization throughout twenty-six states and the Great Lakes area, offers exactly that modern sales service. We welcome your inquiry.

THE CLEVELAND-CLIFFS IRON COMPANY

UNION COMMERCE BUILDING . . CLEVELAND 14, OHIO

At Your Finger Tips...



WHERE TO BUY

SIZES AND WEIGHTS

PERFORMANCE DATA

ENGINEERING SERVICES

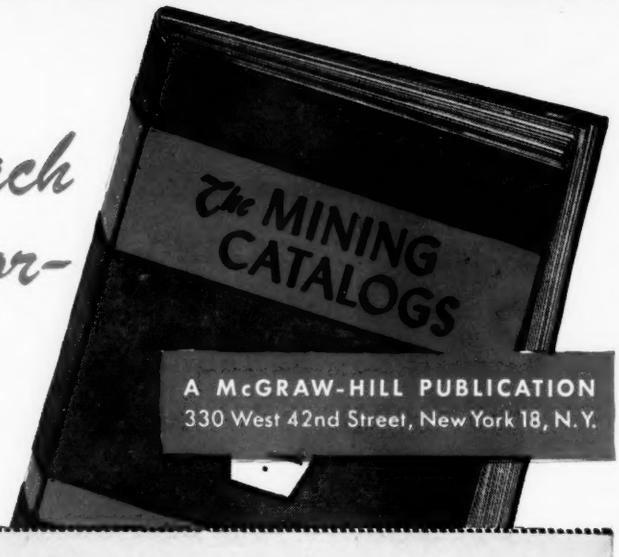
SPECIFICATIONS

On Mining Machinery, Equipment and Supplies

WHETHER it's a crusher, some bearings or a reel of wire rope that you're going to buy for your company, look it up in *The Mining Catalogs*. The information you get in *The Mining Catalogs* is up-to-date, concise but complete, and easy to locate quickly. Manufacturers have condensed their complete catalog information to speed up your search.

10,000 men responsible for specifying or requisitioning are using *The Mining Catalogs* regularly. It makes those jobs easier. Be sure you are on the list to receive your copy of the 1945-1946 edition . . . send the coupon today.

Reach for-



THE MINING CATALOGS, 330 West 42nd St., New York 18, N. Y.

Gentlemen: I am responsible for specifying and requisitioning equipment and supplies needed at our property and do not have access to THE MINING CATALOGS. Please reserve a copy of the 1945-1946 edition for me. (If my country imposes a duty on such Catalog books, I agree to pay same).

Name..... *Title*.....

Company Name.....

Company Address..... *State*.....

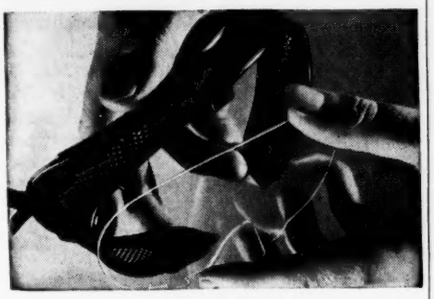
The nature of our operation is.....



Eyes say "Satisfied," behind MONO Goggle



• All day comfort is realized through its light weight (just over an ounce), rolled edges and shape that fits facial contours. The adjustable headband holds the goggle snug without pressure. Two nose sizes assure proper fit.



• Overall eye protection because of large lens firmly anchored in frame but easily replaceable. Resists impact equal to steel ball traveling at 225 ft. per sec. Adequate protection for chipping, grinding, spot welding, etc.



• Available in standard and extra large sizes; curved and flat lens styles; clear or Willson Tru-Hue* green plastic; ventilated or non-ventilated; clear, frosted or green frame. Can be worn over prescription spectacles with comfort.

WILLSON 75 YEARS

For help on your eye-protection problems, get in touch with your Willson Distributor or write for information. *REG. U. S. PAT. OFF.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

WILLSON DOUBLE PRODUCTS INCORPORATED

Established 1870

239 WASHINGTON STREET • READING, PENNA

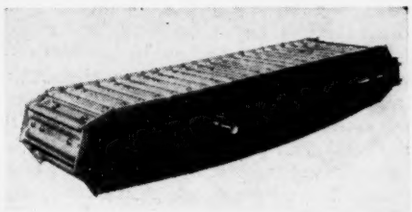
motor mounted types and for either a.c. or d.c. Simplified design, it is said, provides easy replacement of any part, where necessary, without disturbing the brake assembly. All that is necessary for motor mounting is suitable end plate.

•

Conveyor

Chain Belt Co., Milwaukee, offers a completely self-contained factory-assembled heavy-duty apron conveyor unit. The heavy-duty roller-supported apron feeder is furnished in several widths and with centers ranging from a minimum of 4 ft. 7 in. to a maximum of 9 ft. 1 in. varied by 18-in. increments.

This type of feeder is said to be widely

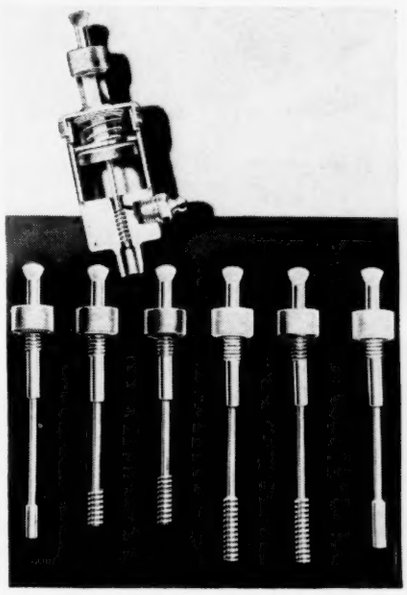


used under bins and hoppers for heavy lump material and has exceptionally large capacity. At a normal speed of 10 ft. per minute, handling 100-lb. material, capacities of these standard units will run up to 80 t.p.h. Because the heavy steel chain belt rides directly on large-diameter traction rollers, the design of the new heavy-duty feeder, it is said, means longer chainbelt life and reduced power consumption.

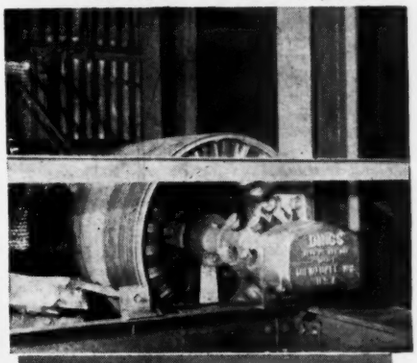
•

Lubricators

Manufacturing rights on Gun-Fil lubricators have been acquired by the Gray Co., Inc., Minneapolis, and are now in production. Designed in four sizes, with capacities ranging from ½ to 8 oz., pressure filled Gun-



Protection Against TRAMP IRON for YOU and YOUR CUSTOMERS



with DINGS Magnetic Pulleys

Protect both your own coal handling equipment and your customer's stokers by installing a powerful Dings Magnetic Pulley to eliminate tramp iron before it can cause expensive damage. Separation is automatic and positive . . . Operating and maintenance cost about a penny a day, depending on pulley size . . . Some operators report "no cost" tramp iron protection because the sale of scrap removed more than pays for depreciation charges and operating expense! Size for size there are no more powerful magnetic pulleys built than Dings. Get full details from Dings today.

NEW! DINGS Magnetic Drill Extractor



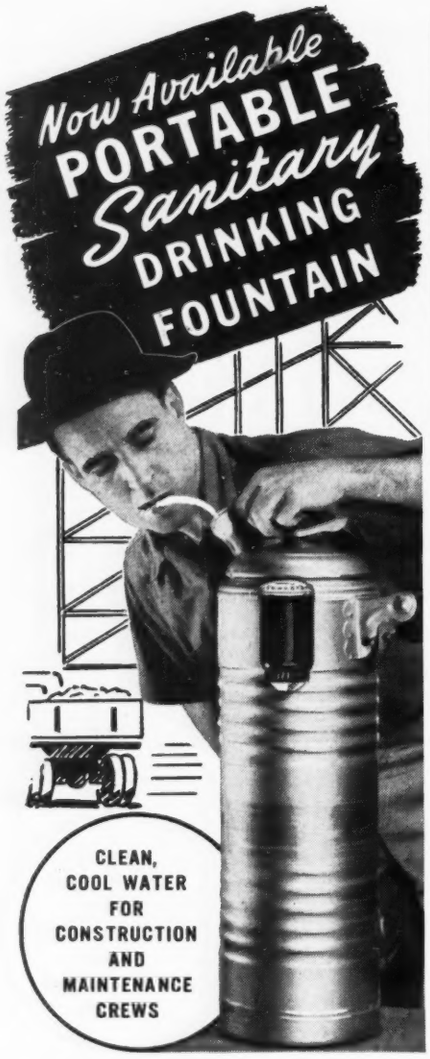
A powerful Alnico Magnetic Drill Extractor to save redrilling blast holes when drill rod or bits break off in the hole. Dings Extractors lift up to 25 times their own weight ... Easy to use . . . Can be carried in a pocket . . . Write for data sheet containing complete information.

DINGS MAGNETIC SEPARATOR CO.

506 E. Smith Street, Milwaukee 7, Wisc.

Dings

"HIGH INTENSITY"



BANISH GERM SPREADING PRACTICES!



Eliminate the use of unsanitary pails, kegs, dippers or cups, and protect the health and strength of your workmen on jobs where *fresh, clean* and *cool* drinking water is not permanently available . . . Save payroll losses by keeping your men on the job! The Dobbins Portable Drinking Fountain does all this by providing protection from disease, colds, etc., which may otherwise be spread with the use of a "common" drinking cup or dipper. Inner water container and bubbler parts made of corrosion-proof stainless steel or plated brass. Fully insulated to keep water *fresh* and *cool*. Four gallon capacity. A few strokes with the pump supplies compressed air for instant flow of water at the press of a button. Fountain equipped with large, comfortable carrying handle; mounting bracket for salt tablet dispenser; loops for carrying strap. Meets requirements of Public Health Authorities!

ORDER DIRECT FROM FACTORY IMMEDIATE DELIVERY

No. 18—***Dobbins Superbilt Portable Drinking Fountain,*** less carrying strap and salt dispenser, **Only $12.50**
Salt Tablet Dispenser, 500 tablet capacity, extra **$2.75**
Adjustable, Waterproof Carrying Strap, extra **$1.00**
Spill Cup, to catch overflow when used indoors . . **$3.50**
All prices F. O. B. Elkhart, Indiana. Illustrated circular will be mailed on request.

DOBBINS MANUFACTURING COMPANY
Dept. 425 Elkhart, Indiana

Dobbins Superbilt
PORTABLE DRINKING FOUNTAIN

Fil lubricators are said to dispense oil or grease automatically in a measured, uniform flow to a moving bearing, and stop feeding lubricant when a bearing becomes motionless.

Six interchangeable valves are available with distinctive colored caps for identification. The valves with colored caps exert varying degrees of control of feed on greases of different densities.

•

Lathe Converter

Master Tool & Machine Co., 30 Church St., New York 17, offers the Master lathe converter for facilitating metal working and repairs in both the shop and the field. Originally developed for Army mobile repair units, the lathe converter is available in three sizes for use on all bench and engine lathes with swings of 9 to 36 in. The converter, with its own drive, is mounted in the toll-post position on either the compound rest or on the cross slide of the carriage with the compound removed. Normal use of the lathe is not restricted, the manufacturer states. The converter also may be mounted on milling machines, enabling a horizontal miller to do vertical milling and die sinking. The converter is described as a precision tool and has been used for such purposes as making "go" and "no-go" gages for aircraft inspection.

As now available for commercial use, the converter consists of a basic unit that will mill, cut keyways and do angular drilling. It is supplied with interchangeable heads for external and internal grinding, and angular milling of threads, worms and screws; a broach attachment for internal keyways and splines; and a dividing head mounted on the open end of the lathe spindle for gear and spline cutting and grinding. In the case of the small maintenance shop equipped only with a lathe and drill press, addition of the converter will enable it to handle any type of machining normally called for, the manufacturer states.

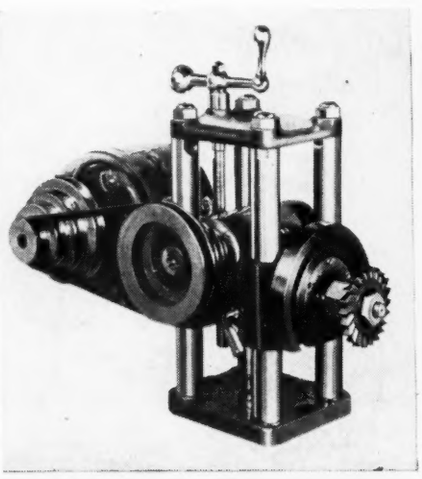
The converter, it is asserted, can form and grind such tools as cutters, hobs, taps and reamers or it can adapt standard tools to special form or size. Being equipped with its own power, the converter can take advantage of the lathe's capacity to rotate the work piece without interfering with cutting and grinding. Use of the dividing head on the lathe spindle accurately positions the work piece for cutting gears and splines or for spacing holes drilled around a center.

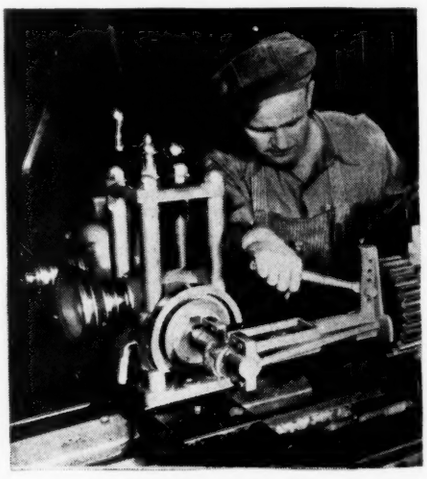
•

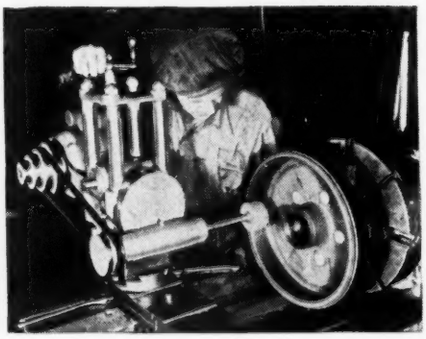
Electrode

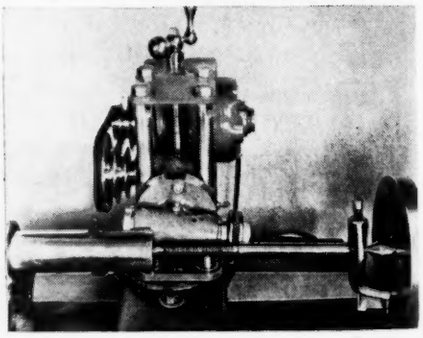
A new all-position mild-steel electrode, called Airco No. 312, is offered by Air Reduction Sales Co., 60 East 42d St., New York 17, designed primarily to prevent underbead cracking in the welding of hardenable steels.

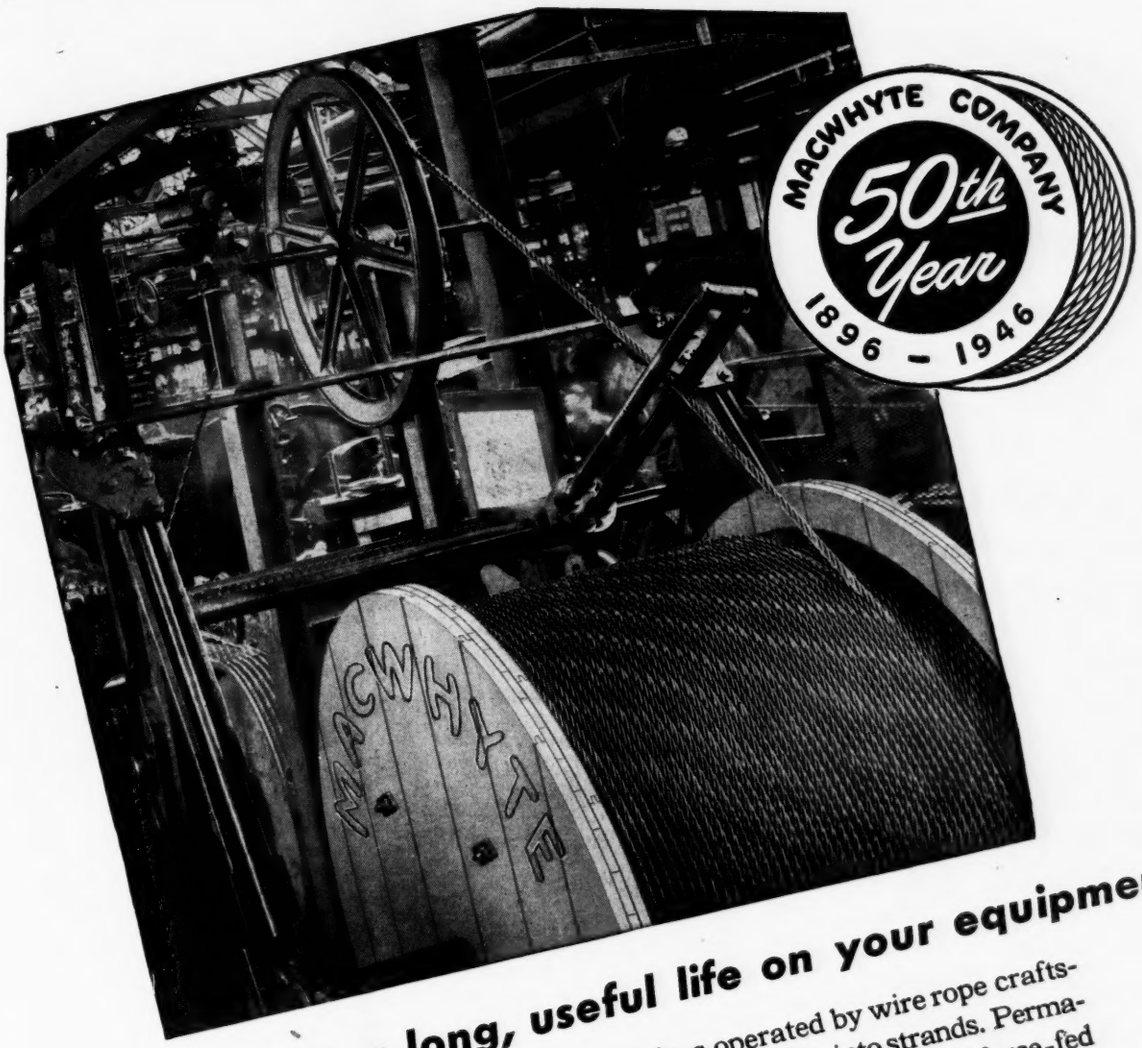
Laboratory tests and field applications are said to indicate that this electrode is satisfactory for welding low-alloy high-tensile steels, particularly in heavy sections where preheat must be used with conventional type electrodes to minimize cracking; free machining steels that normally run quite high in sulphur; cold-rolled steels where excessive porosity normally is encountered with conventional type mild-steel electrodes.











Ready to start a long, useful life on your equipment

Here you see Macwhyte Wire Rope as it comes from the closing machine. It is now ready to start giving the long service that has been so carefully built into it.

Select quality steel rods were its beginning. They were scientifically heat-treated and cold-drawn, into tough, metallurgically uniform wire. Precision machines operated by wire rope craftsmen layed the wire into strands. Permanent internal lubrication was force-fed around each wire. Closing the lubricated strands completed the wire rope that will give longer, more economical performance on your equipment.

Macwhyte distributors and factory representatives are at your service.

Make MACWHYTE your headquarters for WIRE ROPE AND SLINGS



170-page Wire Rope Catalog G-15, yours for the asking

Lists Macwhyte's complete line. Gives other valuable information. Ask any Macwhyte representative or write Macwhyte Company.

MACWHYTE COMPANY

Wire Rope Manufacturers

2931 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York · Pittsburgh · Chicago · Fort Worth · Portland · Seattle San Francisco · Distributors throughout the U. S. A. and other countries

MACWHYTE PREformed and Non-PREformed Wire Ropes and Internally Lubricated Wire Rope . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . Braided Wire Rope Slings . . . Aircraft Cables, Assemblies and Tie-Rods . . . Stainless Steel Wire Rope, Monel Metal Wire Rope, Galvanized Wire Rope.

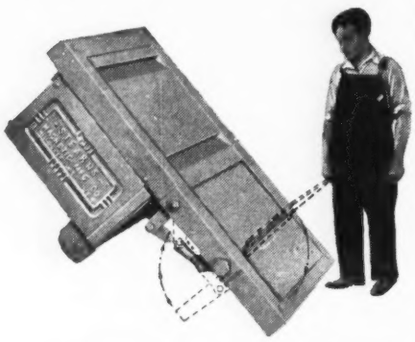
MD. 860

NO MORE TRAMP IRON

with a

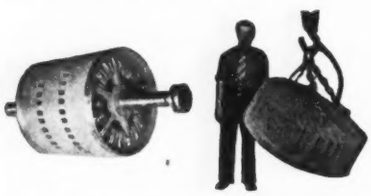
Stearns MAGNET

AUTOMATIC SPOUT TYPE SEPARATOR



If you have a "dirty coal" problem as the result of tramp iron and junk, it will pay you to investigate the STEARNS spout magnet shown above.

Built for rugged service, gives positive, automatic protection. In all sizes. Write for our Bulletin 97-A.



Also widely used are STEARNS Improved air-cooled powerful Magnetic Pulleys (our Bulletin 302) and Suspended Magnets (Bulletin 25). Tell us about your capacities, plant layouts, etc.

STEARNS MAGNETIC MANUFACTURING CO.

661 S. 28th St., Milwaukee, Wis.

STEARNS-MAGNETIC MILWAUKEE

Industrial Notes

ROOTS-CONNERSVILLE BLOWER CORP., Connersville, Ind., has elected J. S. Tatman as chairman of the board and John Avery as president and general manager. Mr. Tatman has been associated with Roots-Connersville since his graduation from Purdue in 1902 and is a vice president of the Compressed Air and Gas Institute. Mr. Avery, previously manager of the blower and compressor department of Allis-Chalmers Mfg. Co., Milwaukee, has been active in centrifugal compressor engineering for the past 22 years.

CATERPILLAR TRACTOR CO., Peoria, Ill., has advanced Kenneth F. Park, sales development manager, to the newly created post of engineering consultant in the earth-moving field, serving the company's three sales divisions in both the United States and Canada. Mr. Park joined Caterpillar in 1944 after more than ten years' association with the R. G. LeTourneau, Inc., as chief field engineer.

JONES & LAUGHLIN STEEL CORP., Pittsburgh, has established a new district sales office in Indianapolis and has appointed H. M. Knobloch, assistant district sales manager in Cincinnati, as district sales manager in charge. W. L. O'Connell, formerly resident manager of sales in Indianapolis, has been appointed resident manager of sales in South Bend.

WICKWIRE SPENCER STEEL CO., New York, has appointed J. G. Curry, associated with the company for some years, as assistant sales manager of its structural products division, with offices in Buffalo.

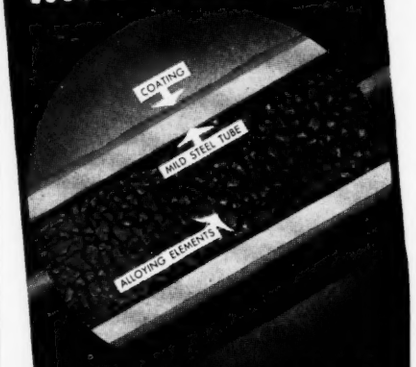
RAYBESTOS-MANHATTAN, INC., MANHATTAN RUBBER DIVISION, Passaic, N. J., has placed Harry E. Smith, vice president, in complete charge of its rubber products sales and marketing, a new post created to strengthen and coordinate its future marketing efforts.

AMERICAN HOIST & DERRICK CO., St. Paul, has named E. S. McCormick as its district representative in the Chicago area. Lt. McCormick, recently released from the U. S. Navy Seabees, was connected with the company in its home office prior to entering the service.

INDUSTRIAL DIAMOND ASSOCIATION OF AMERICA, 501 Fifth Ave., New York, a new trade association, has been formed by a group of leading industrial diamond firms to promote the progress and development of the industrial diamond and diamond tool industry and its service to American industry. Athos D. Leveridge, formerly chief of the Diamond Dies section of the War Production Board, has been elected executive director and secretary-treasurer.

INTERNATIONAL HARVESTER CO., Chicago, has announced the establishment of a new research project devoted to the intensive study and improvement of manufacturing methods and processes for the entire line of its products. The new project, which is

COATED STOODY MANGANESE



Avoids Brittle Weld Deposits

and brings you improved welding qualities

Manufacturing manganese electrodes by usual methods presents complications Too little manganese may cause brittleness of deposits . . . too much makes drawing impossible. STOODY neatly solves the problem with an improved method of manufacture. Alloying elements are tightly rolled in mild steel tubes. Percentage of manganese can thus be raised to allow for burn-out loss with an ample margin of safety to assure maximum toughness and wear resistance in welded deposits. Drawing limitations are thus completely sidestepped!

Coated Stoody Manganese

gives you fast burn-off rate, low spatter loss, low penetration and high build-up. It can be applied with either AC or DC machines and slag is easily removed immediately after welding.

Try this improved manganese electrode on your next build-up of manganese steel equipment. Trial order of 50 lbs. costs 40c per lb. in 3/16" or 1/4" rod sizes f.o.b. Whittier or distributor's warehouse. Discounts on quantity orders.

For maximum life and wear resistance hard-face all built up parts with STOODY SELF-HARDENING! Literature on request.

STOODY COMPANY

1140 W. SLAUSON, WHITTIER, CALIF.

STOODY HARD-FACING ALLOYS

Retard Wear Save Repair

planned to occupy 230,000 sq.ft. in the Chicago plant operated by Foote Bros. Gear & Machine Corp. during the war, will supplement the manufacturing research carried on at individual Harvester plants. M. C. Evans, manager of Harvester's manufacturing and training department, will direct the new activity.

United States Rubber Co., New York, has appointed Walter F. Spoerl as general sales manager of its mechanical goods division, succeeding Herman A. Everlien, who died suddenly Feb. 21 after 43 years with the company. Mr. Spoerl, who joined the company 38 years ago, has been merchandise manager of the mechanical goods division since 1944.

Pittsburgh Plate Glass Co., Columbia Chemical Division, Pittsburgh, has appointed William F. Newton manager of research and development. He joined the company's research staff in 1941, becoming division superintendent in charge of synthetic resins and related organic products two years later. The Columbia Chemical Division also has announced the return of Capt. J. Calvin Lee, recently released from the army, as a representative in the Cincinnati area. He was associated with the division in its Cincinnati office for four years prior to his entrance into the service.

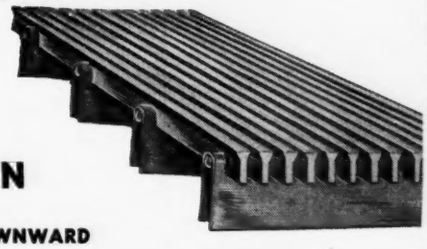
Allegheny Ludlum Steel Corp., Pittsburgh, has announced completion of arrangements with Airco Export Corp., subsidiary of Air Reduction Co., for world-wide representation on an exclusive basis for its stainless steel products, electrical steels and alloys.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has announced that with the virtual completion of military explosives production its military explosives division will be known as the nitrocellulose and sporting powder division. F. W. Bradway, formerly general assistant to the explosives department management, is manager of the new division, and J. M. Skilling, who was manager of the military explosives division, is director of production. In other shifts, P. J. Kimball, formerly general superintendent of the department, becomes manager of the explosives division; F. R. Wilson, division manager, becomes director of production; T. R. Carlson, who was director of production, has been named production manager of the high explosives section, and H. C. Peinert, who held that position, becomes production manager of the black powder section, succeeding I. J. Cox, recently retired.

Reliance Electric & Engineering Co., Cleveland, has announced the purchase of a 25-acre site in Ashtabula, Ohio, for the erection of a new plant costing $750,000. When completed, the new plant will be used for the production of 1- to 15-hp. electric motors and V-S drives, and with machinery and equipment will represent a total investment of more than $1,500,000, according to J. W. Corey, president of the company. Karl H. Meyer, presently manager of the marine division of the company, will become factory manager of the new plant upon completion.

INCREASE PRODUCTION
LOWER MAINTENANCE

SIZING AND DEWATERING FINE COAL



WITH THE
PROFILE-BAR
WEDGE-BAR SCREEN
WITH CONTINUOUS
SLOT OPENINGS ENLARGING DOWNWARD

CONTINUOUS SLOTS	=	GREATER OPEN AREA
OPENINGS ENLARGED DOWNWARDS	=	QUICK DISCHARGE OF UNDERSIZE—NO BLINDING
DEEP SECTION PROFILE BARS U-SHAPED CROSS SUPPORTS	=	ASSURE GREATER CARRYING CAPACITY AND LONG LIFE
SUM TOTAL	=	GREATER EFFICIENCY AND LONGER LIFE

Wedge-bar screen sections are designed and fabricated to fit your equipment for the most efficient screen performance and longest life.

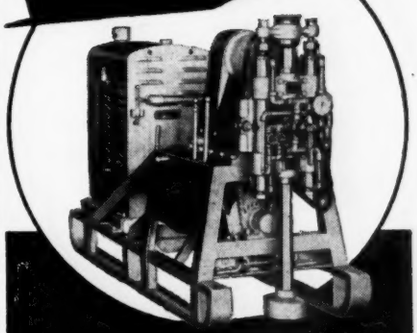
WEDGE-BAR SCREEN COMPANY
640 W. 134th St., New York 31, N. Y.
Shaker Jackets • Vibrating Screen Panels • Chutes • Conveyors • Dryers

Fairbanks, Morse & Co., Chicago, has annnounced that Arnold G. Brown, manager of its pump division, was elected president of the National Association of Vertical Pump Manufacturers at the association's recent meeting in Chicago. Joe Downs, of A. D. Cook, Inc., Lawrenceburg, Ind., was elected vice president.

Gar Wood Industries, Inc., Detroit, has named R. J. Nymberg, formerly sales engineer, as sales manager of its hoist and body division. He joined Gar Wood in 1921. Ross Miller, acting temporarily as manager of the Philadelphia hoist and body division branch, has succeeded A. E. Hilderley, retired. Edward F. Kreutzfeld has been named to succeed Mr. Miller as service manager of that division; William F. Keeton has been placed in charge of the company's newly created advertising department and Charles J. Hoffman has been named to head its newly formed export department.

Pittsburgh Plate Glass Co., Pittsburgh, has announced promotion of five executives. Joseph G. Thompson Jr., supervisor of trade sales development at the Milwaukee plant, has been named assistant general paint manager. Fergus A. O'Connor, with the company for 23 years, has been appointed supervisor of dealer sales; and Nelson A. Mason is now supervisor of maintenance-painter sales. Leonard W. McGarity, who has returned to the company after three years' service in the Navy, has been named supervisor of paint department sales to company stores; and Kenneth E.

Diamond Core Drilling
CONTRACTORS



Testing mineral properties with our light gasoline drills. SATISFACTORY COAL CORES GUARANTEED. Ground solidification by our pre-pressure grouting method for shafts. We mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

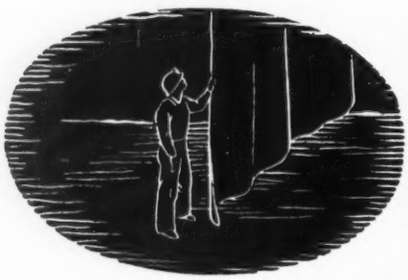
MOTT CORE DRILLING CO.
HUNTINGTON • WEST VIRGINIA



ABC

JUTE BRATTICE CLOTH

● Adequate ventilation is vitally necessary to safe, efficient mine operation. Use American Brattice Cloth — closely woven construction cuts air-leaks to a minimum — special chemical treatment renders it abrasion, flame and rot-proof. ABC can be moved easily — used over and over. Its surface is smooth, thus passing machinery or cars cannot pull it down or damage it. These features combine to assure efficiently ventilated working places at minimum cost — advantages that can be yours! Write today for complete information.



AMERICAN
BRATTICE CLOTH CORP.
WARSAW - INDIANA

Whitekettle, now on terminal leave as a captain in the Army Air Forces, has returned to the company as supervisor of brush sales.

HALL LABORATORIES, INC., Pittsburgh, Pa., has established a new department to handle problems of industrial waste and stream pollution, and has placed Charles F. Hauck, recently engineer at Ravenna Ordnance Center, in charge.

SINCLAIR REFINING CO., New York, N. Y., has appointed Paul W. Zumbrook as manager of domestic lubricating oil sales, according to an announcement by J. E. Dyer, vice president. Mr. Zumbrook joined Sinclair in 1916, and after wide experience in the company, in 1936 became lubricating sales manager for the central district, which position he leaves for his new assignment.

ADEL PRECISION PRODUCTS CORP., Burbank, Calif., has elected as president and general manager Clinton E. Stryker, formerly vice president and assistant to the president of the Nordberg Mfg. Co., Milwaukee, Wis.

MCNALLY-PITTSBURG MFG. CORP., Pittsburg, Kan., has announced that at the request of the Turkish Coal Commission it is sending R. C. Woodhead, one of its coal preparation engineers, to that country to make surveys and proposals for coal preparation plants for benefication of Turkish coal along American lines. The new coal-development area is located on the south shore of the Black Sea at Zonguldak and is to be exploited under a Turkish Government seven-year plan for industrial expansion. This is Mr. Woodhead's third foreign trip. He represented the company in the erection of coal plants on two previous trips to Brazil.

UNITED SAFETY AND CLAIMS, Louisville, Ky., has appointed Walter Hornsby, formerly superintendent of Martin No. 8 H mine, Utilities Elkhorn Coal Co., Martin, Ky., as safety engineer for its Alabama, Virginia, Tennessee and eastern Kentucky territories, with headquarters at Middlesboro, Ky. Mr. Hornsby brings to his new association an enviable record of safety work at the Martin mine, which was credited with having the best safety record in 1945 among Class A mines in the Big Sandy-Elkhorn district.

LIQUID CARBONIC CORP., New York, has named Arlen Z. Jennings consulting engineer. He has been district engineer of the U. S. Bureau of Mines, Chicago, for the past three years.

ATHEY PRODUCTS CORP., Chicago, has announced the return to its sales staff of A. W. Fulton, recently released after three years in the Navy. He joined Athey in 1936, and was associated with the Caterpillar Tractor Co., Peoria, Ill., from 1929 to 1936.

WESTINGHOUSE ELECTRIC CORP., Pittsburgh, has announced that the facilities of the B. F. Sturtevant Co., purchased by Westinghouse in Sept., 1945, are being integrated with those of the Westinghouse air conditioning division, which has transferred to the Sturtevant main plant at Hyde Park, Boston. Ellis L. Spray, Westinghouse vice president, has been named executive vice president of the new organization, known as the B. F. Sturtevant Co. division of Westinghouse Electric. G. C. Perry, formerly Sturtevant vice president, has been elected vice president and general manager of the new division.

R. G. LETOURNEAU, INC., Peoria, Ill., has appointed Oscar W. Nelson as vice president and general manager. He was formerly general manager of the Beaver (Pa.) plant of the propeller division of the Curtiss-Wright Corp.

PITTSBURGH CORNING CORP., Pittsburgh, has announced plans for a $300,000 plant construction program to expand existing facilities for the manufacture of Foamglas, a glass insulation material, at its Port Allegheny (Pa.) plant.

RANSOME MACHINERY CO., Dunellen, N. J., has appointed P. J. Patton, Jr., formerly associated with the welding equipment division of A. O. Smith Corp., as regional manager of the Midwestern area for its industrial division, with offices in Chicago.

THERMOID CO., Trenton, N. J., has elected Dwight P. Allen as executive vice president. He has been vice president and director of manufacturing operations.

EUCLID ROAD MACHINERY CO., Cleveland, Ohio, has placed in charge of its field engineering Thomas A. Cantrell, recently released from the Army Engineers as a major.

QUALITY **MARLO** **PACKING**

METALLIC & SEMI-METALLIC

PACKING

for

MINE PUMPS

"The Packing that gets the Repeat Orders"

For deep mine pumps. Resists acid mine waters. Keeps grit out of stuffing box. Three types.

● MARLO ALL PURPOSE METALLIC PACKING

Best ever devised. Will not freeze at 70° below, soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

● "TWIN-TWIST" SEMI-METALLIC PACKING

Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressibility. Never hardens. For temperature up to 500° F.

● "RED WATER" SEMI-METALLIC PACKING

Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

Let us serve you

THE MARLO COMPANY
38 HOWARD ST.
NEW YORK, N. Y., U. S. A.

FORGED!

The bases of Crosby Clips have the extra strength and shock-proof ability that only generously proportioned forgings can give. Recommended by users and distributors everywhere.



Manufactured by
AMERICAN
HOIST & DERRICK
COMPANY
St. Paul 1, Minnesota

CROSBY CLIPS

ST. LOUIS SNAPSHOTS



THE LUCKY FELLOW,
HE HAS A
RESERVATION
AT THE
HOTEL
Mayfair
EIGHTH AND ST. CHARLES STS.

Trade Literature

PORTABLE GENERATOR AND FLOODLIGHT SETS—Consolidated Diesel Electric Corp., 230 East Eighth St., Mt. Vernon, N. Y. Folder outlines uses and advantages of stationary and portable power generator sets and portable floodlight units, and illustrates several of the 40 fields listed in which application of the generator sets for standby and exclusive power source and the floodlight units for night work have been made.

DOZER-SHOVEL—Bucyrus-Erie Co., South Milwaukee, Wis. Illustrated 24-page bulletin describes the Dozer-Shovel for International TracTracTors, depicting actual operating conditions on a wide variety of digging, earth-moving, and material-handling jobs. Of special interest are the sections pictorially describing the features which, the manufacturer asserts, make the Dozer-Shovel unique among tractor loaders: low overhead clearance and generally compact design for high maneuverability; high visibility; maintenance of tractor balance; smooth hydraulic control; and easy interchangeability from shovel to bulldozer, and vice versa.

ELECTRONICS — Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa. "Electronics Digest" (B-3726) records the latest developments in electronics at work, including stratovision, mot-o-trol, fluorescent lighting, electrolytic tin plating, X-Ray inspection, and electrostatic air cleaning, together with an explanation of the electron theory and basic electronic devices. The 30-page illustrated booklet, with the exception of the article on stratovision, comprises non-technical digests of material previously published in technical magazines, and is published quarterly.

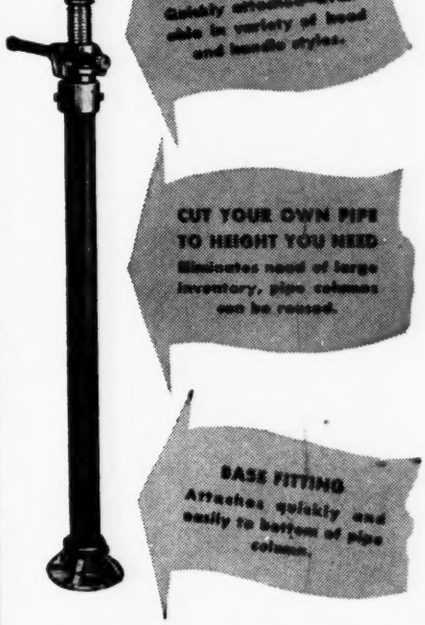
CRANES—Orton Crane & Shovel Co., 608 South Dearborn St., Chicago. Booklet contains case histories and widely divergent problems handled by the company's full-revolving cranes. Thoroughly illustrated, the booklet, entitled "Moving Materials," suggests various solutions and methods of increasing efficiency of present loading and unloading systems.

PROTECTIVE CLOTHING—B. F. Goodrich Co., Akron, Ohio. Catalog section covers the company's complete line of industrial protective clothing and includes heavy-duty models for firemen, policemen and workers in various fields. Pictured and described are the "V"-sealed raincoat, vinyl resin-coated work coat, various industrial and specialized work coats, plastic-coated protective sleeves, workers' leggings, plastic-coated aicidproof apron, heavy-duty industrial apron, laboratory apron, hurricane hat, Worn-N-Weather hat, Ameripol apron, electricians' gloves, rubber gloves and rubber footwear.

WORM GEAR UNITS—Cleveland Worm & Gear Co., 3277 East 80 St., Cleveland, Ohio. Bulletin lists applications of worm-gear speed reducers to various types of mixing and grinding equipment in use by eleven different industries. Each drive application is illustrated by a halftone and a facsimile blueprint. Standard Cleveland drives and

DUFF-NORTON
MINE ROOF
JACK FITTINGS

New, Economical Type Tailor-Made to Meet YOUR Needs



Make your own adjustable roof jacks by attaching Duff-Norton Fittings to standard pipe cut to the length you need for your operations. You thus eliminate the need for large inventories of roof jacks, reduce costs, assure a dependable stock of roof jacks for all lengths required. Pipe columns and fittings can be used over and over.

Write for details on these cost-cutting Fittings and on the Standard Type Duff-Norton Mine Roof Jack.

THE DUFF-NORTON
MANUFACTURING CO.
PITTSBURGH, PA.
Canadian Plant
COATICOOK, QUE.
There is a Distributor Near You

The "C-M-I" CONTINUOUS CENTRIFUGAL

Dewaters granular materials such as the finer coal sizes at a lower cost per ton than any other known method or machine.

And, the dewatered product is in such a physical condition that freezing, clogging of spouts, bins and cars is almost prohibited.

With the liquid being forced through a fine screen by means of the centrifugal forces, the "C-M-I" may be so arranged that considerable amount of the semi-colloidal fines are discharged with the liquid, or arranged so that most of these fines may be recovered.

Our engineering staff will appreciate having the opportunity of going into the details of your drying problems.



Centrifugal and

Mechanical Industries
INC.
3600 South Second Street
St. Louis 18, Mo.

the Speedaire fan-cooled unit recently acquired by the company also are described.

EMPLOYEE SUGGESTIONS—Elliott Service Co., Dept. S 58, 219 East 44th St., New York 17, N. Y. Folder, "How to Get Ideas," describes the complete materials and information available to assist management in setting up and successfully operating an employee suggestion system designed to stimulate production, build morale and foster cooperation between employer and employee.

pH EQUIPMENT—Bristol Co., Waterbury, Conn. Bulletin pH302 covers line of pH control instruments. Continuous pH controllers and recorders are described in detail, including electrode assemblies and accessories. Engineering and technical information relative to pH theory and measurement is given and a variety of actual installations are described, with chart records, halftones and flow diagrams included.

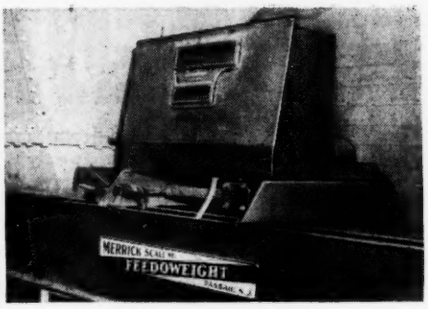
CONCRETE CONSTRUCTION—Sika Chemical Corp., Gregory Ave., Passaic, N. J. Folder describes properties and action of Plastiment, a concrete densifier recommended by the manufacturer for use in concrete to improve its water-tightness and surface hardness.

AUTOMATIC CLUTCH—Hardinge Co., Inc., York, Pa. Bulletin No. 46 describes the BLM "Auto-Centri" clutch, the manufacturing and sales rights for which have been obtained by the Hardinge Co. from the Automatic Clutch Corp. of Canada, a subsidiary of the British Meter Co. This automatic clutch is available in sizes from fractional to 5,000 h.p. for any type of power drive. Installed with an electric motor drive, it permits use of a standard squirrel-cage motor with across-the-line starting equipment in place of a slip-ring or high-starting-torque squirrel-cage motor with expensive starting equipment. As the motor approaches full-load speed and maximum torque, the clutch picks up the load gradually, eliminating shock loads. On drives using internal-combustion motors, the clutch will automatically disengage the load when the motor is throttled to idling speed.

WATER STRAINER—S. P. Kinney Engineers, Inc., 233 Oliver Ave., Pittsburgh 22, Pa. Folder describes the Brassert self-cleaning water strainer, including the capacities, the straining media, and other engineering data covering the latest design.

ROAD DRAINAGE—Armco Drainage & Metal Products, Inc., Central Division, P. O. Box 170, Middletown, Ohio. Booklet contains two reprinted articles on the proper drainage of roadways and runways which outline the usual mistakes and discuss methods of correction, together with methods of effective subdrainage and trench construction.

HEAVY-MEDIA SEPARATION — American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. Ore Dressing Notes No. 14 contains detailed information on heavy-media separation processes and a description of the various new metallic and non-metallic heavy-media separation installations now



THE MERRICK
FEEDOWEIGHT
Reg. U. S. Pat. Off.
tells rate per hour —weight per day

A self-contained automatic conveyor scale, combined with automatic gate to give feed rate control. Powered feed regulator operates gate, without restraint on scale beam. Feed rate may be varied. Large feed opening insures even flow. Uniformly feeds bulk material BY WEIGHT; and automatically totalizes weight of materials fed. Durable. Simple to operate. Rugged, heavy duty design. Slow moving parts mean long life. Easy to install and maintain.

we also manufacture
The Merrick WEIGHTOMETER, which weighs any material carried on a belt conveyor without interrupting conveying operation. Complete descriptive matter on request.

MERRICK SCALE MFG. CO.
Engineers & Mfgrs. of Automatic Weighing Equipment
PASSAIC, N. J., U. S. A.

FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



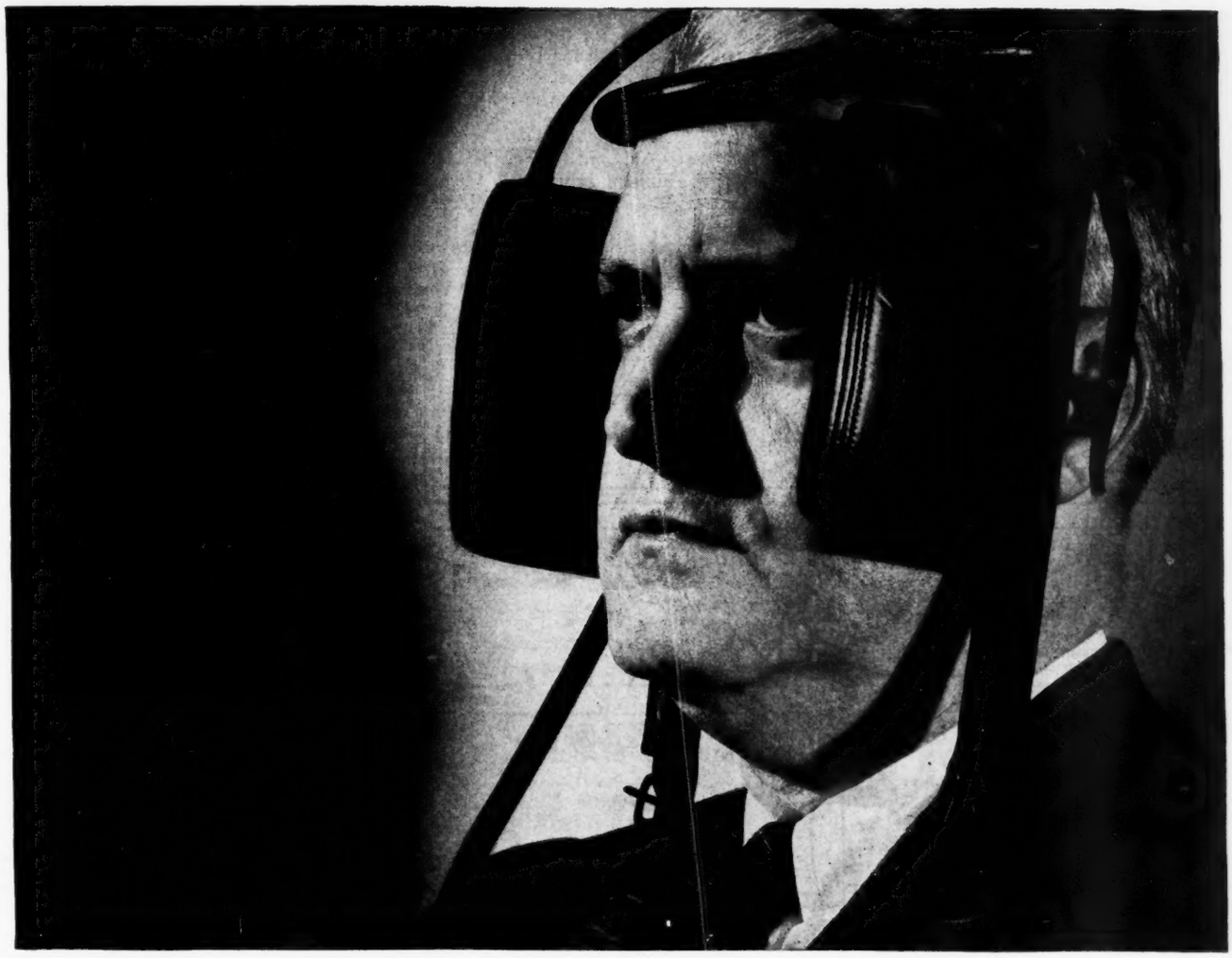
Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS



PITTSBURGH
KNIFE & FORGE CO.
1421 Reedsdale St., N.S.
Pittsburgh 12, Pa.



Meet the Man Who Makes a Virtue of a

ONE-TRACK MIND

Ordinarily, it is no compliment to say a man has a "one-track" mind. But in the special sense in which we apply the term to S-A engineers, it describes a singleness of purpose that saves American industry countless thousands of dollars on bulk material handling operations.

It describes an ability to approach any problem with but one thought in mind: the development of a system that will convey the *right* volume to the *right* place, at the *lowest* cost per ton. S-A engineers are aided in this task by an unrestricted choice of equipment—a complete line of conveyors and accessories designed and built by the company that for 45 years has led the field with new units and new methods.

If you want the man whose "one-track mind" can help you achieve utmost material handling efficiency, talk to an S-A engineer.



STEPHENS-ADAMSON MFG. CO.

2 RIDGEWAY AVENUE, AURORA, ILLINOIS • LOS ANGELES, CALIF • BELLEVILLE, ONT.

Designers and Manufacturers of All Types of
BULK MATERIAL HANDLING EQUIPMENT

in commercial operation treating zinc, lead-zinc, iron, fluorspar, tin, magnesite and garnet ores, anthracite and bituminous coal. It also contains the results of laboratory tests on samples of a number of other ores which demonstrate the excellent results obtained by heavy-media separation.

TAPE—B. F. Goodrich Co., Akron, Ohio. Catalog folder on its lines of rubber tapes and splicing compounds features the Two-In-One tape, said to weatherseal wire or cable splices in one operation in less than half the time needed for the combined use of friction tape and splicing compound. A single layer provides adequate insulation for lines carrying up to 220 volts; a double layer on lines up to 650 volts.

BULLDOZERS—Caterpillar Tractor Co., Peoria 8, Ill. Bulletin Form 9198 features Nos. 8S and 7S (straight-type) bulldozers for exclusive use with Caterpillar diesel D8 and D7 tractors, citing the following attributes: balanced design; unexcelled digging characteristics with high visibility for the operator, ease of mounting and dismounting; correctly curved mold board; reinforcing plates for pusher loading and to back up cutting edge; easily made blade pitch and tilting adjustments; blade follow-through; rigidity; long life and sheave support arrangement eliminating the A-frame structure.

STEEL CASTINGS—Vulcan Iron Works, Wilkes-Barre, Pa. Folder describes the facilities and complete service offered by the Vulcan steel foundry for the casting and machining of carbon-and-alloy steel castings up to 40,000 lb. Methods of manufacture and examples of various types produced are illustrated.

CARBON BRUSHES FOR D.C. ARC WELDERS—Ohio Carbon Co., 12508 Berea Road, Cleveland 11, Ohio. Catalog No. 15 lists complete specifications of carbon brushes for types of d.c. arc welders made by various manufacturers. Welders are listed by manufacturer, model, type and amperes. In addition to number of brushes, type, etc., the brushes are illustrated to facilitate visual comparison. A special chart permits ordering by dimensions where model data are unavailable.

VALVES—Alloy Steel Products Co., Linden, N. J. Technical Information Bulletin No. 2 describes the construction, properties and performance of Aloyco-20 corrosion-resistant valves. The various types available are shown and detailed sizes and specifications are listed. An additional folder illustrates models and manufacturing processes of the company's line of stainless-steel corrosion-resistant valves.

CAR SHAKE-OUT—Robins Conveyors, Inc., Division of Hewitt Rubber Corp., Passaic, N. J. Booklet describing the new Robins car shakeout for emptying hopper-bottom railroad cars includes illustrations, complete details of a number of the field tests and a thorough explanation of the design and simplified operation of the unit.

TOOL STEELS—Jessop Steel Co., Washington, Pa. Bulletin displays the many types of Jessop cast-to-shape tool steels, which, according to the manufacturer, require a minimum of machining and finishing and thus save on both time and cost for the user.

MOTOR GENERATORS—Motor Generator Corp. Division, Hobart Bros. Co., Troy, Ohio. Folder illustrates various motor-generator sets, a.c. and d.c. generators, and other special units now available.

ROTARY-DISC VACUUM FILTER—General American Transportation Corp., 420 Lexington Ave., New York 17, N. Y. Folder describes the Conkey rotary-disc vacuum filter manufactured by its General American Process Equipment Division, and contains information on applications, operation, construction, auxiliary equipment, and sizes.

WELDING LENS—Eastern Equipment Co., Willow Grove, Pa. Folder illustrates and describes a full line of welding lenses for goggles, helmets and handshields, and industrial safetylenses for chipping and grinding operations.

PROFESSIONAL SERVICES

ALLEN & GARCIA CO.
ENGINEERS AND BUILDERS OF MODERN COAL OPERATION
Authoritative Valuations, and Reports of Mining Properties Equipment and Operation.
332 S. Michigan Ave., Chicago
120 Wall Street, New York, N. Y.

HERBERT S. LITTLEWOOD
CONSULTING ENGINEER
Application - Supervision of Installation
Maintenance - Inspection - Testing
POWER-HAULAGE-HOISTING-VENTILATION
211 Carnegie Place — Pittsburgh 8, Pa.

JOSEPH M. BRAY, PhD
Mining Engineer — Geologist
Examinations, Valuations, Reports
Mining, Preparation, Rock & Earth Work
Telephone 2791
Hazleton Nat'l Bank Bldg., Hazleton, Penna.

McNEIL & McNEIL
Engineers
179 W. Washington St. — Chicago 2

HAROLD G. BURRILL
AND ASSOCIATES
Lewis L. Gwin — *H. Stuart Smith*
Power Plant and Transmission Lines
Mine Ventilation, Haulage and Drainage Systems
Sewage Disposal and Water Supply
Industrial Plants, Surveys, Reports
Baltimore, Md. — Altoona, Pa.

C. C. MORFIT & ASSOCIATES
Consulting Engineers
Reports, Valuation, Construction, Operation, Management
11 Broadway, New York 4, N. Y.

F. CARL COLCORD
Consulting Engineer
COAL LAND VALUATIONS
MINE INSTALLATION AND OPERATION
1133 Union Trust Bldg., Cincinnati, Ohio. Phone Cherry 5403
Box 268, Paris, Ky. Phone 643

SHERWIN and JANVRIN
Mining Engineers
Pineville, Ky.
Reports on COAL PROPERTIES
Planning, Construction & Supervision

EAVENSON & AUCHMUTY
Mining Engineers
Coal Operation Consultants
Valuation
2720 Koppers Bldg. — Pittsburgh 19, Pa.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers—Consultants—Builders
"Practical Application of Skilled Engineering to your Coal Preparation Problems."
1005 Sycamore Bldg., Terre Haute, Indiana
Crawford 7051

J. H. FLETCHER
30 Years
Continuous Consulting Service to Coal Mines
Telephone Harrison 5151
McCormick Building — Chicago, Illinois

L. E. YOUNG
Consulting Engineers
MINE MECHANIZATION
MINE MANAGEMENT
Oliver Building—Pittsburgh, Pa.

T. W. GUY
COAL PREPARATION
To Yield Maximum Net Return
Face and Product Studies
Plant Design and Operation
Coal Sampling
Kanawha V. Bldg. — Charleston, W. Va.

Consulting Engineers
can save you money—by saving TIME . . . never more important than it is today!

Coal Age FOR MAY

WILL BE THE MINING EFFICIENCY NUMBER

When you have read COAL AGE for May, we honestly believe you will say there has never been anything like it before. It will describe the methods used by Coal-For-Victory Award-winning mines, as studied by our editors right at those mines. It will be full of the most practical operating information on both deep and strip mining and coal cleaning and preparation. It will be easy to read and well illustrated with charts, pictures and working diagrams. It will be interesting and full of help for every kind of job in the coal industry.

TEAM WORK DID IT!

Every one who benefits from the Mining Efficiency Number will owe much to the operating officials of Coal-For-Victory mines for their wonderful cooperation. Everywhere our editors went, these men talked freely and in detail about the methods they employ and the records they have made. This willingness to share their "know-how" is largely responsible for this unusually valuable issue—one which we believe you will study, pass around, and keep for years.

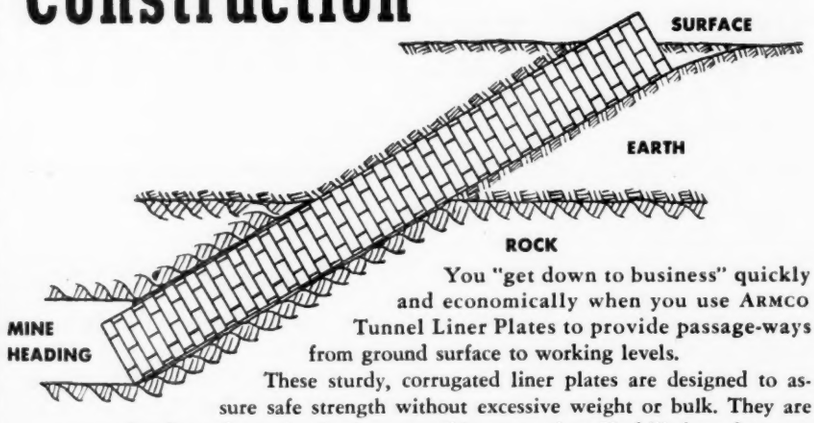
Coal Age

A McGRAW-HILL PUBLICATION

330 WEST 42 STREET • NEW YORK 18, NEW YORK

HERE'S SPEED AND ECONOMY
In Sloped Entry Construction





You "get down to business" quickly and economically when you use ARMCO Tunnel Liner Plates to provide passage-ways from ground surface to working levels.

These sturdy, corrugated liner plates are designed to assure safe strength without excessive weight or bulk. They are easy to handle and require the least possible excavation. Unskilled workers can install them quickly, using only structural wrenches. In case of disaster you'll find Armco Plates fireproof and a definite help in limiting the area of damage. Openings may be arch-shaped, with a span of 14 to 18 feet, or full-round, which require no footings.

Save time and money by using Armco Plates for sloped entries, tunnels, airshafts, escape-ways, or wherever else you need the protection of a steel liner. Write for the new Armco Mining Folder and specific job data. Armco Drainage & Metal Products, Inc., and Associated Companies, 1785 Curtis Street, Middletown, Ohio.

ARMCO TUNNEL LINER PLATES

. . . invaluable for gaseous mines

If tripped by overload, moving handle to "Reset" puts the Flood City Starter back in operation. Delon grid contacts allow great interrupting capacity. Permits maximum motor performance — assures positive protection with no fuse necessary.



Write for free bulletins

"No Fuse"
Type Permissible Starter

Flood City Brass & Electric Co.
JOHNSTOWN PA.

DOWFLAKE
CALCIUM CHLORIDE 77-80%

makes more friends for coal



THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN
New York • Boston • Philadelphia • Washington
Cleveland • Detroit • Chicago • St. Louis • Houston
San Francisco • Los Angeles • Seattle

CGC

Continental BEARINGS

Babbitted & Anti-Friction Pillow Blocks

from

STOCK

Also Shafting, Collars, Couplings, Clutches, Takeups and other lineshaft accessories.



Send your inquiries to our nearest District Office.

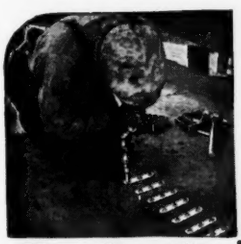
50-A

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

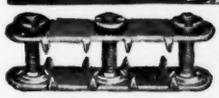
CGC ATLANTA • DALLAS • MEMPHIS CGC



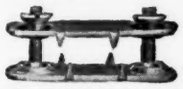
Keep your conveyor belts going with

FLEXCO

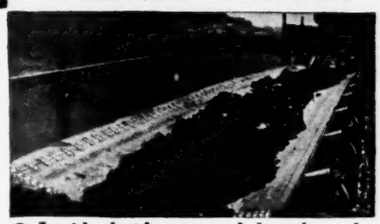
HD BELT FASTENERS



• **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.



• **FLEXCO H D BELT FASTENERS** make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.



• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.



Write for your copy

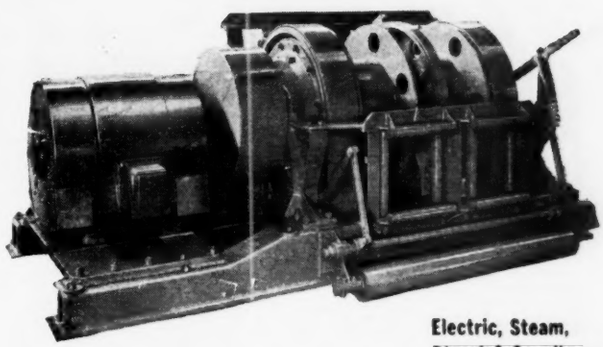
FLEXIBLE STEEL LACING COMPANY
4638 Lexington St., Chicago 44, Illinois

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

VULCAN

HEAVY DUTY DENVER

Scraper Loaders



With 100 H.P. Continuously Rated Motors. Seventy in use at one property. Engineered for 60" to 72" scrapers. Steel construction; ball bearing thruout

Electric, Steam, Diesel & Gasoline Hoists; Scrapers, Loaders, Conveyors, Skips, Cages, Sheaves.

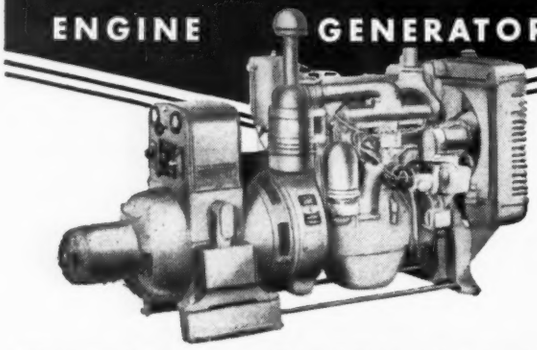
VULCAN IRON WORKS CO
DENVER COLORADO

Makes Electric Power Available Anywhere!

Low Cost Electricity with

READY-POWER

ENGINE GENERATORS



Powered by International Harvester Engines—Diesel, gasoline or natural gas. 7½KW to 50KW.

READY-POWER Engine Generators produce low cost electric power and permit the electrification of operations miles beyond the power lines. In many cases, important savings over central station power costs can be had. READY-POWER Engine Generators are sold and serviced by the world-wide International Harvester Power Unit dealer organization, and backed by the READY-POWER Company's twenty-two years of successful experience in producing engine generators.

THE READY-POWER CO.

11231 Freud Ave. • Detroit 14, Mich., U.S.A.



"Pulsating Magnet" ELECTRIC VIBRATORS

on those troublesome, "Constipated" bins and hoppers to keep their contents agitated and free-flowing.

"Vibra-Flow" VIBRATORY FEEDERS

under those bins and hoppers to regulate their discharge by rheostat control of rate of flow.

by SYNTRON

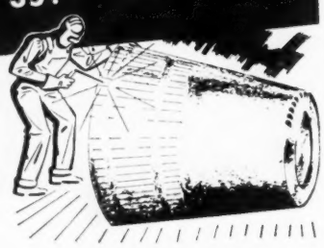
REG. TRADE MARK

Write for catalog literature

SYNTRON COMPANY

975 Lexington Homer City, Pa.

What Hardness Do You Want Here? Rockwell 20? - - 35? - - 45? - - 55?



At last — a simpler, surer way of buying hard-surfacing electrodes. A new way that ends confusion and guesswork.

P&H Harcote, a famous name in hard-surfacing electrodes—has now been redesigned in a series of four new electrodes for Rockwell C hardnesses of 20, 35, 45 and 55. If crusher jaws require a hardness of 45 — you order and use Harcote 45. It's that easy!

Get the facts today. See your P&H representative or write for information. P&H also makes electrodes for every other welding requirement.

"Harcote 20" Rockwell C Hardness 15-25

"Harcote 35" Rockwell C Hardness 30-40

"Harcote 45" Rockwell C Hardness 40-50

"Harcote 55" Rockwell C Hardness 50-60

P&H

General Offices: 4540 W. National Ave., Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

WELDING ELECTRODES · MOTORS · HOISTS · ELECTRIC CRANES · ARC WELDERS · EXCAVATORS

National

CLASSIFIED ADVERTISING

for bringing business needs or opportunities to the attention of men associated in administrative, executive, management, sales and responsible technical, engineering and operating capacities with the industries served by

The SEARCHLIGHT SECTIONS of

Air Transport
American Machinist
Aviation
Aviation News
Bus Transportation
Business Week
Chemical and Metallurgical Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering News-Record
Engineering and Mining Journal
E & M J Markets
Factory Management and Maintenance
Food Industries
Power
Product Engineering
Textile World.

For advertising rates or other information address:
Departmental Staff

McGRAW-HILL PUBLISHING CO., INC.

330 W. 42nd St., New York 18, N. Y.

Every mine operator knows that easy maintenance and the ability to replace parts quickly are of utmost importance in the selection of Sand Drying Stoves. The SUTTON Sand Drying Stove offers those advantages in a big way! This unit requires little or no attention for operation and unskilled labor can use the stove to its fullest capacity. Its efficiency has been proved in actual use all over the world for more than 40 years.





To demonstrate how easily you can replace parts on SUTTON Dryers we have pictured here the component parts—all of which are available for immediate delivery. To order you merely name the part and identify the stove by the number on its door.

SUTTON
Sand Drying Stoves

1. Skirting
2. Dome
4. Top Ring
5. Door Barrel
6. & 7. Fuel Chute with Fire Door
7. Fire Door Only
8. Perforated Ring
11. Fire Grate
13. Grate Handle
14. & 15. Base with Base Door
15. Base Door only
16. Bottom Plate
17. Feet

External Gratings

18. Long Sections only of external Gratings
19. Left short sections only of external Gratings
20. Right short sections only of external Gratings

INDIANA FOUNDRY COMPANY
INDIANA, PA.

LUBRIPLATE

THE MODERN LUBRICANT

THERE IS A LUBRIPLATE PRODUCT FOR YOUR EVERY NEED

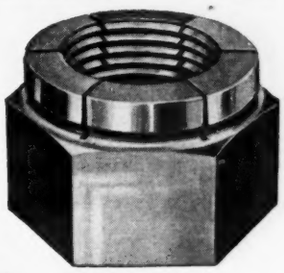


LUBRIPLATE represents one of the most important advancements in lubrication in many years. It possesses characteristics not found in conventional lubricants. In addition to superior lubricating qualities it prevents rust and corrosion. The adoption of LUBRIPLATE by practically all important industries is indeed a record of achievement. LUBRIPLATE is available in a number of fluid and non-fluid densities to meet every operating condition.

. . . Write for a booklet, "The LUBRIPLATE Film" written especially for your industry.



Here's a Lock Nut that *really holds!*



Pat'd & Pat's Pend.

FLEXLOC

Search no more . . . This all-metal one-piece "Flexloc" Stop and Lock Nut has every desirable feature. Just look them over:

√ It is of one-piece construction

√ It can be made of any of the conventional nut materials

√ Every thread — including Locking threads — takes its share of the load

√ Its construction is especially advantageous for maximum strength and dependability of low and thin nuts

√ It accommodates itself to a very wide range of thread tolerances

√ It can be used over and over again without losing its ability to lock

√ It is not affected by temperatures likely to be met within the field of Mechanical Engineering

√ Being a "stop" nut, it stays locked in any position on a threaded member

Sizes from No. 6 to 1" in diameter; millions in use. Write for Bulletin 582.

The famous "Unbrako" Socket Screw Products are also made by us.

STANDARD PRESSED STEEL CO.
JENKINTOWN, PENNA, BOX 738
Boston - Chicago - Detroit - Indianapolis - St. Louis - San Francisco
OVER 40 YEARS IN BUSINESS



This name on a reel—
means

TOUGH WIRE ROPE

For rugged, long-lasting wire rope be sure it bears the name Wickwire Spencer. Every step in the making of Wickwire Rope is under constant, careful control, from the special formulae used in making the steel, through processing of the wire until it is exact within a fraction of a thousandth of an inch, through laying of the strands and final closing.

Order Wickwire Spencer Wire Rope and be assured of the utmost in performance, safety and long rope life. It is available in all sizes and constructions—both regular lay and WISSCOLAY *Pre*formed.

HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS . . .

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

SEND FOR YOUR FREE COPY



Send your wire rope questions to

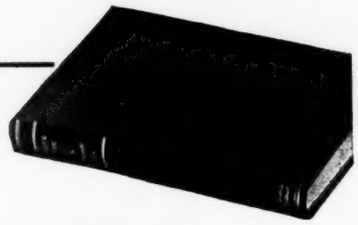
WICKWIRE SPENCER STEEL

A DIVISION OF THE
COLORADO FUEL AND IRON CORPORATION
EXECUTIVE OFFICES—500 FIFTH AVE., NEW YORK 18, N. Y.
Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Denver • Detroit
Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester

3

McGraw-Hill books
to help you on the job

See them for 10 days FREE Trial examination



MECHANICAL LOADING OF COAL UNDERGROUND

By IVAN A. GIVEN, Editor, **Coal Age. 397 pages, 6 x 9, $4.00.**

Most efficient methods of using various types of loading machines, conveyors, scrapers, and certain special equipment, in the loading and handling of coal underground. Discusses types of equipment used in slope-sinking, entry-driving, and development work, and in production of coal from the usual or regular working sections. Demonstrates methods used with various types of equipment, and installation of machinery. Includes over 200 maps, plans and sketches.

AMERICAN ELECTRICIANS' HANDBOOK

By TERRELL CROFT. Revised by **CLIFFORD CARR,** Head of Electrical Engineering Department, Pratt Institute. **1600 pages, 1177 illustrations, 5 x 7½, $5.00.**

Packed with the facts which every man engaged in electrical work needs at hand, from clear explanation of the fundamentals of electricity to means of remedying electrical equipment troubles. Helps electrical men select and install commercial electrical apparatus and materials, and operate and maintain all electrical equipment. Covers conductors, circuits, general equipment, generators, motors, transformers, outside distribution, interior wiring and electric lighting.

MECHANICAL ENGINEERS' HANDBOOK

Edited by LIONEL S. MARKS, Gordon McKay, Professor of Mechanical Engineering, Emeritus, Harvard University. **2276 pages, $7.00.**

Covers every branch of mechanical engineering, from aeronautics to mechanical refrigeration, from power generation to welding, from metal-cutting machines to hoisting and conveying—with a profusion of concise descriptions, fundamentals, formulas, methods, tables, diagrams, etc. The contributors number more than 100 engineers and specialists. 4th edition largely rewritten, fully revised, chock-full of the most useful and up-to-date facts.

You may see one or all for 10 days test period

FILL IN AND MAIL THE ON-APPROVAL COUPON

McGRAW-HILL Book Co., Inc., 330 W. 42nd St., New York 18, N.Y.

Send me the books checked below for 10 days' examination on approval. In 10 days I will send remittance, plus few cents postage, or return books postpaid. (Postage paid on cash orders.)

- ☐ Given's—Mechanical Loading of Coal Underground **$4.00**
- ☐ Croft's—American Electrician's Handbook **$5.00**
- ☐ Mark's—Mechanical Engineers' Handbook **$7.00**

Name .....

Address .....

City and State .....

Company .....

Position C-4-46

(For Canadian prices, write: Embassy Book Co. 12 Richmond St. E., Toronto 1)

UNIT 357
MOBILE CRANE
Cuts Coal Handling Costs!

Self-propelled . . . Rides on rubber . . . Operated by ONE MAN . . . Powered by ONE engine . . . Controlled from ONE position in cab. Rugged . . . Compact . . . Well-balanced, Plenty of LIFT ability . . . Full-revolving . . . Speedy . . . Safe. Ideal for cramped yard operations. Fully convertible. Write for literature.

Full Vision Cab
Operator can see in ALL directions. Promotes safety.

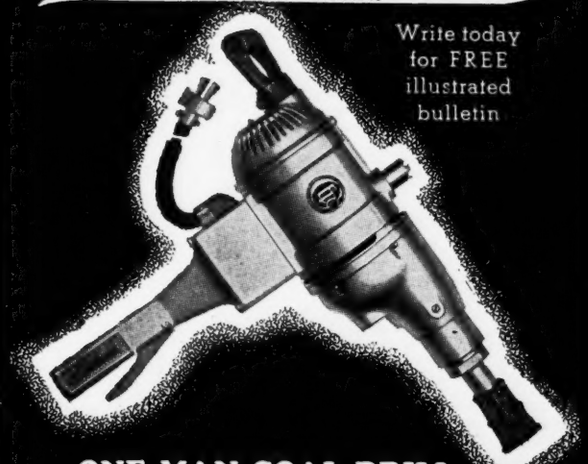
Contact Factory DIRECT for Price and Delivery



CAPACITY 5 TONS
3/8 or 1/2 YD.

UNIT CRANE & SHOVEL CORP. MILWAUKEE 14, WIS., U. S. A.

The Cincinnati
TRADE MARK



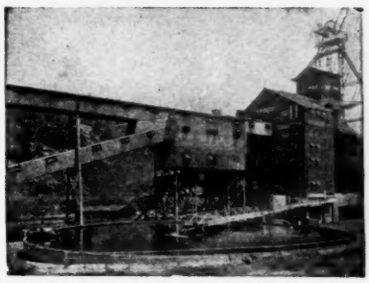
Write today for FREE illustrated bulletin

ONE-MAN COAL DRILL

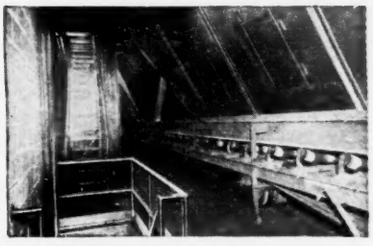
. . . lowers drilling costs because it is designed and constructed to give more power "pound for pound" and more drilling efficiency "day after day". Used successfully in drilling both anthracite and bituminous coal. Easy to operate. Sold with money-back guarantee. Write today.

THE CINCINNATI ELECTRICAL TOOL CO.
Division of The R. K. LeBlond Machine Tool Co.
2635 MADISON ROAD - CINCINNATI 8, OHIO

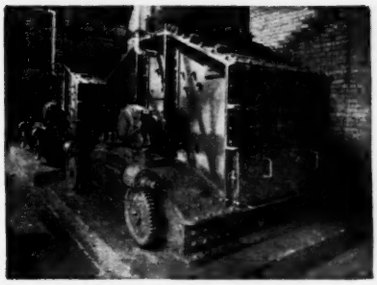
"PENNSYLVANIA"



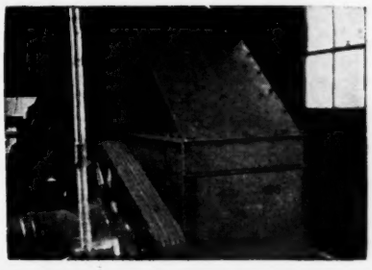
"PENNSYLVANIA"
BRADFORD COAL BREAKER AND CLEANER, installed in large Coal Cleaning Plant, for preparing 500 tons hourly of ROM to 4½" size, for washing. Patented.



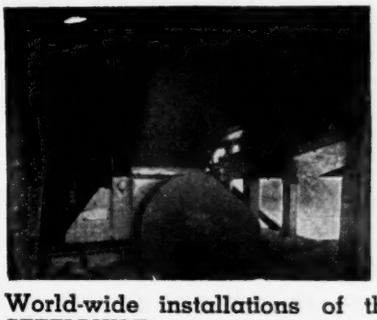
"PENNSYLVANIA"
Bradford - Hammermills crushing, cleaning and delivering to Belt 1400 tons of prepared coal hourly, at one of the world's largest Generating Stations. Patented.



"PENNSYLVANIA"
REVERSIBLE HAMMERMILLS preparing Bradford-treated coking coals for By-Product Ovens—at the rate of 600 tons per hour. Patented.



"PENNSYLVANIA"
SLOW SPEED GRANULATOR preparing "Premium" Domestic Stoker Sizes at Mine. This advanced type is also widely used in Industrial Power Plants. Patented.



"PENNSYLVANIA"
Type K Single Roll Crusher—with automatic tramp iron protection—preparing commercial sizes at mine. Adjustable for 1" to 8" sizing without shut-down. Patented.

World-wide installations of these "Pennsylvania" STEELBUILT types, prepare approx. 300,000,000 tons of Steam and Coking Coals per annum.

Experience gained from these installations during the past 40 years, is at your service.

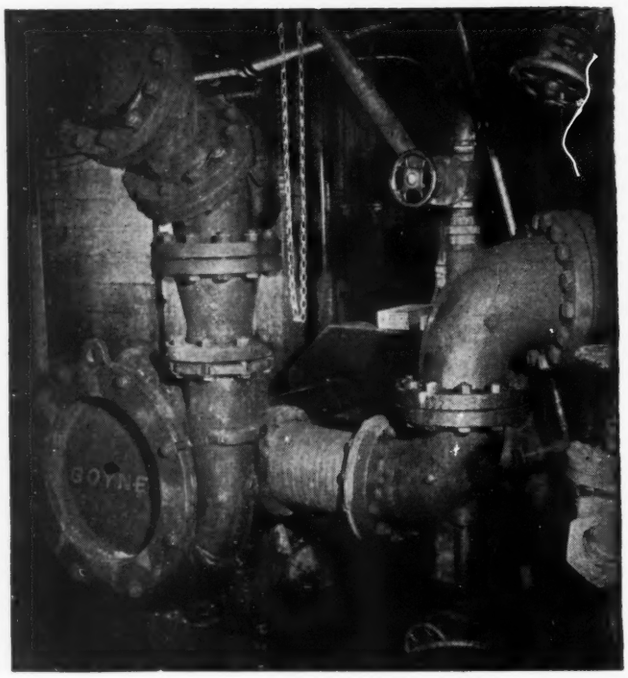
General Offices: Liberty Trust Bldg., Philadelphia

PENNSYLVANIA CRUSHER COMPANY

Associated with Fraser & Chalmers Engrs. Wks., London

COAL PREPARATION

GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.

2. The one packing box of the pump subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.

3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.
ASHLAND, PA.

The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

Beard's

Mine Examination Questions and Answers

3 volumes — $7.50, payable in four monthly payments

HESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc.

They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must **know.**

Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

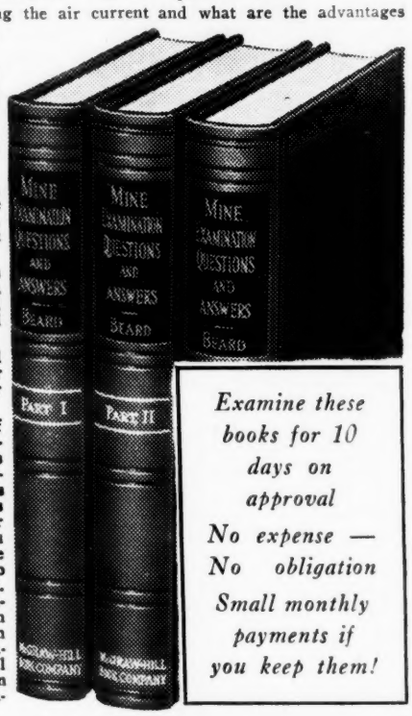
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an oil pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full-correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operations problems.



Examine these books for 10 days on approval

No expense — No obligation

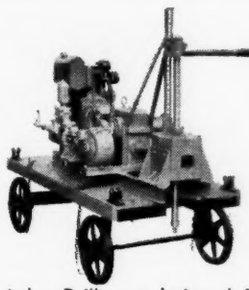
Small monthly payments if you keep them!

McGRAW-HILL ON-APPROVAL COUPON

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y.
Send me charges prepaid, **Beard's Mine Examination Questions and Answers,** 3 volumes, for 10 days' examination. If satisfactory I will pay $7.50 at the rate of $1.50 in ten days and $2.00 per month. If not wanted I will return the three volumes postpaid.

Name .....
Address .....
City and State .....
Company .....
Position .....C. 4-46

(For Canadian prices, write: Embassy Book Co., 12 Richmond St. E., Toronto, 1.)



CORE DRILLING FOR COAL

* * * *

Complete line of tools and equipment for proving coal seams—determining overburden before strip mining—all mineral prospecting and sub-surface exploration.

* * * *

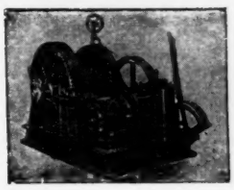
Acker Drills are designed for quick moving—can be mounted on small motor truck—trailer or drag skids. Simple to operate.

Send for literature

ACKER DRILL COMPANY

Scranton 3, Pennsylvania

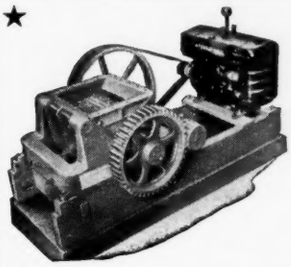
FLORY HOISTS



Manufacturers of Steam, Electric and Gasoline Hoists of all types; also parts for all model Flory Hoists.

FLORY MANUFACTURING COMPANY, BANGOR, PENNSYLVANIA

★



BANTAM BUSTER

COAL CRUSHER

McLanahan builds a type and size for every coal crushing requirement! Write for data.

Pit, Mine and Quarry Equipment Headquarters

Established 1835

McLANAHAN AND STONE CORPORATION

HOLLIDAYSBURG, PENNSYLVANIA

PERFORATED METAL

COAL MINING SCREENS

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.

2443 West 24th Place

CHICAGO, ILLINOIS

Canal 1459

POSITIONS VACANT

WANTED: MINING Engineer by Eastern Kentucky Coal Co. Good living conditions. Give full details in your first letter. P-337, Coal Age, 330 W. 42nd St., New York 18, N. Y.

BUSINESS OPPORTUNITIES

FOR SALE: Eastern Ohio farms, underlaid with three seams of high grade coal, suitable for drift or strip mining. Now available blocks of 100 to 1000 acres, rail and river transportation. For further information write: Frank Signorelli, Realtor, Weirton, W. Va.

$700,000.00 COAL MINE Central Illinois, 60,000,000 tons in sight, mining 1000 tons daily production can be doubled with right management. Wm. H. Jordan, 712 North Dearborn Street, Chicago 10, Illinois.

FOR SALE: Stripping coal mine 160 acres surface and timber 60 acres upper Freeport, 4 ft coal overburden 10 to 30 ft. Lower Freeport about 25 acres. 5 to 30 ft. Overburden, 55 to 60 in coal. 160 acres each Kattanings total about 450 acres of coal. Average heights 48 to 60 in. 5½ mi. from Western Maryland RR Siding. Mineral County, West Va. $12,500 cash. Paul Newell, 3636 Van Horn Rd., Trenton, Michigan. Phone 0557-M.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT : BUSINESS : "OPPORTUNITIES" : EQUIPMENT : USED OR RESALE

UNDISPLAYED ——RATES—— DISPLAYED

10 CENTS A WORD. MINIMUM CHARGE $2.00.
Positions Wanted (full or part time salaried employment only) ½ the above rates payable in advance.
Box Numbers—Care of publication New York, Chicago or San Francisco offices count as 10 words.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Individual Spaces with border rules for prominent display of advertisements.
The advertising rate is $6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS received by March 28th will appear in the April issue, subject to limitations of space available.

16,500 acres land with estimate of 300,000,000 tons of coal, $7.50 per acre. Also coal land suitable for strip mining. Complete details upon request.

G. B. LORRAINE

Law Bldg. Richmond 19, Va.

FOR SALE

Deep Shaft Coal Mine, capacity 700-800 tons daily; underground excellent; located Illinois Belleville District; output sold for all this year. Owner has other interests and must sell.

PRAIRIE STATE COAL COMPANY

788 Yale Avenue, University City 5, Mo.

SALESMAN WANTED

Must be acquainted with mining operations in the Pittsburgh area. Attractvie proposition for the right man. Well established company. Give complete details in reply.

SW-353, Coal Age
330 West 42nd St., New York 18, N. Y.

$10,000

Buys A-1 Truck Coal Mine. Located on Paved Highway and Rail Road. Approximately 600 acres coal right @ 1c per ton royalty basis. 200 acres bought outright. Goes with property. Completely equipped for 300 tons per shift. Haulage locomotive 2 mining machines in A-1 condition. No. 6 seam—7 ft. Coal. Rock top. Now operating.

WENNEBORG COAL CO.

Sherman, Illinois

MORE PROFITS

FOR YOUR COMPANY LESS WORRY AND EXPENSE

FOR YOU

TO sell your business for cash to a reputable and experienced operating concern with substantial capital may be the best thing for both the company and you.

WE are principals (not brokers) with a record of successful operating experience. Present company personnel retained wherever possible.

• *ALL discussions and negotiations strictly confidential*

Box 1222, 1474 Broadway, N. Y.

FOR SALE

MINE CARS
400—4 ton Watt Rotary Dump Steel Mine Cars, 42" gauge, 16" Timken Bearing Wheels, height 42".

MOTOR GENERATOR SETS
1—500 KW G.E., 250/275 volt DC, 3 phase, 60 cycle, 2300 volt AC, full automatic.
3—300 KW G.E., 250/275 volt DC, 3 phase, 60 cycle, 2300 volt AC.
2—200 KW G.E.—Same as above.

ROTARY CONVERTERS
2—300 KW G.E., 275 volt DC, type HCC-6, 1200 RPM, 2300 volt transformers.

LOCOMOTIVES
6—15-ton Goodman, type 136-A, 250 volt DC, 42" gauge.
2—15-ton Westinghouse, type 908-C, 250 volt DC, 42" gauge.
4—13-ton Jeffrey MH-110, 250 volt DC, 42" gauge.
6—8-ton G.E., type HM-822, 250 volt DC, 36" gauge.
8—8-ton Goodman, type 32-A, 250 volt DC, 42" gauge.
15—6-ton Goodman, type 33, 250 volt DC, 42" gauge.

LOADING MACHINES
21—5-BU Joy, 250 volt DC.
2—#3 Myers-Whaley Automat, 250 volt DC.

CUTTING MACHINES
4—29-C Jeffrey Arcwalls, 250 volt DC.
4—29-L Jeffrey, 250 volt DC.
2—Goodman 324-AA, 250 volt DC.

TIPPLES
Several 3, 4 and 5-track Steel Tipples.

ELECTRIC HOISTS
200 to 1500 H.P.



Frank J. Wolfe

We specialize in buying complete mines that are going out of business or from receivers in bankruptcy, administrators of estates, etc.

COAL MINE EQUIPMENT SALES COMPANY

306-7 BEASLEY BUILDING — L. D. Phone-34 — TERRE HAUTE, INDIANA

CARS FOR MOVING REFUSE SLATE AND GOB

78—50-Ton Side Discharge Hopper Cars, 1831 cu. ft., 50-ton capacity, Cast Steel Side Frames.

10—50-ton, 30 cu. yd., Magor Automatic Air Dump Cars. Lift doors with aprons.

50—40 and 50-ton, 20 cu. yd., Western Automatic Air Dump Cars. Lift doors with aprons.

IMMEDIATE DELIVERY

IRON & STEEL PRODUCTS, INC.

41 years' experience

13484 S. Brainard Ave., Chicago 33, Illinois

"*ANYTHING* containing IRON or STEEL"

REBUILT MINING EQUIPMENT

DOUBLE DRUM HOIST

1—50 HP Lidgerwood Double Drum Hoist, drums 24" x 24", good for 5000# RP and 4000 ft. of ½" rope, motor driven

MOTORS - GENERATORS - TRANSFORMERS

JOHN D. CRAWBUCK CO PGH. (12) PA.

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton 13" to 56" Track Gauge

GREENSBURG MACHINE CO.
Greensburg, Penna.

TOP CUTTING MACHINE

1—Goodman type 724 E J 250 volt, 9ft. Cutter Bar with two chains, adjustable from 35" to 77" cut.

JONES MINING EQUIPMENT CO.
Empire Bldg. Pittsburgh 22, Pa.

Coal Cutting Machines

2—35B Jeffrey 250 V., shortwalls
2—35BB Jeffrey A.C., shortwalls
2—35BB Jeffrey 500 V. D.C. permissible shortwalls
2—35B Jeffrey 500 V., shortwalls
1—124EJ Goodman, 50 HP, 250 V., permissible track mounted slabbing machine
1—29C Jeffrey top cutting arcwall 250 V., D.C.
1—7AU Sullivan, 3 phase, 60 cycle, 220 V.
1—12G3 Goodman, shortwall, 3/60/220 V., A.C.
1—36B Jeffrey 250 V., 14" high

Electric Locomotives

1—15 Ton GE 250 V., 42" gauge
1—13 Ton GE with HM-809 motors
1—10 Ton GE same as above
2—6 Ton Jeffrey, MH-88 motors, any gauge.
1—6 Ton GE, with HM-823 motors.
2—5 Ton Goodman 250 V., 36" gauge
1—4 Ton Jeffrey, with MH-96 motors

Miscellaneous

1—165 HP GE Syn. 2200 V., 900 RPM motor.
1—150 KW Ridgeway Syn. M-G Set, 250 V., D.C.

TIPPINS MACHINERY CO.
Pittsburgh 13 Pennsylvania

For Sale—

SHASTA DAM SAND AND GRAVEL PLANT AND 10-MILE CONVEYOR EQUIPMENT

Including:
8500—36" AND 42" IDLERS.
Pulleys and Drives.
LATE MODEL 200 HP., 1800 R.P.M. GE MOTORS, complete with Starting Equipment.
Western Gear Reducers, 200 HP., 40 to 1 Ratio.
Dorr Hydroseparators and Classifiers.
30' Tripper and Trestle.
Merrick Feedoweights and Weightometers.
All Types of Pumps, complete with Drives.
42" Pendulum Room Conveyors, 100' and 200'.
Electric Line Equipment, Transformers, Motors and Supplies.
Other Miscellaneous Contractors' Equipment.

Subject to Prior Sale

Write, Wire or Telephone Redding 1440

COLUMBIA CONSTRUCTION CO., INC.
Box 579 Redding, California

B-Erie 1½ yd. gas-air shovel, GA-3, rebuilt.
Bucyrus 50B and 80B steam shovels.
Marion electric shovels, 4, 3, and 1-yd.
Draglines, 2-yd. Diesel; 3-yd. electric.
Porter, Vulcan 18-ton stm. locos., 36", rebuilt.
Vulcan 29-ton stm. locomotives, 42" & std. ga.
Whitcomb 8-ton gas locomotives, 24" gauge (4).
Steam locomotives, 58, 60, 80, 140 tons, std. ga.
Hydroelectric gen. plant, 1000 KVA, 65' head.
Euclid 6-yd. bottom dump crawler wagons (8).

H. Y. SMITH CO., 828 N. B'way, Milwaukee 2, Wis.

NEW

A. C. MOTORS

USED

AC & DC MOTORS

35 KWMG Set. Centrifugal Pumps

Agents

CUTLER HAMMER CONTROLS
ARMATURE & MOTOR REWINDING

UNITED ELECTRIC & MACHINE CO.
315-317 Cherry St. Terre Haute, Ind.

for Quick ANSWERS to business problems, use the Searchlight Sections of:

American Machinist	Electronics
Aviation	Eng. & Min. Jour.
Business Week	Eng. News-Record
Bus Transportation	E. & M. J. Markets
Chem. & Met. Eng.	Factory Mgt. & Main.
Coal Age	Food Industries
Construction Methods	Power
Electrical Contracting	Product Engineering
Electrical Merchandising	Textile World
Electrical World	

Classified Advertising Division
McGraw-Hill Publishing Co.
330 W. 42nd St., New York City

CALL MOORHEAD
In Pittsburgh
FOR REBUILT MINING EQUIPMENT

MINING MACHINES

1—12 DA 50 HP 250 v. Goodman Shortwall.
12 G3 Goodman Std. 220/3/60 6' bar.
2—212 G3 Goodman AC Low Vein Shortwall.

STORAGE BATTERY LOCOMOTIVES

2—6 Ton G.E. Permissible Locomotives 36/44" Ga. O.S. armorplate frame. Inside steel tired wheels. 2-HM 825 Ball Bearing Motors. Type LSBE. Class 2C6 Form C9, 13½' long, 50" high, 69" wide and 44" Wheel base.
Each of the above units equipped with Edison Battery 80 cell A-10—one new in 1940, the other in 1939.
1—5 to 5½ Ton Type D Ironton, 36 or 42" Ga.
1—5 Ton Atlas 40" or 44" Ga. with 2 Ball Bearing Motors. Battery box on top of locomotive.
4 Ton 36" Ga. Atlas 2 BB Motors.
4 Ton 36" Ga. G.E. 2 BB Motors.

Haulage & Gathering Locomotives

13 Ton Westgh. 250 c. 36" or 40" Ga.
13 Ton Westgh. Bar Steel 500 v. 40/42".
2—13 Ton G.E. 5" armorplate 500 v. 44" Ga.
1—6 Ton Jeffrey 250 v. 40/42" Ga. Gath.
1—5 Ton 30B Goodman 250 v. 36" Ga. elec. reel.
1—5 Ton Morgan Gardner 250 v. 36/42" Ga. gath.

ENGINE GENERATOR & TURBINE SETS

65 HP Primm Oil Engine belted to AC or DC Gen.
37.5 KVA Allis Chalmers Gen. 220/3/60—Kerr Tur.
50 KW West. 125 v.—Skinner Engine.
50 KW 125 v. DC West. Turbo Gen.

COAL CRUSHERS

18 x 24 and 18 x 30 New Scottdale dbl. roll.

SCREENS

2—4" x 5' single deck Tyler Hummer Screens. Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

AIR COMPRESSORS

1300 cu. ft. 100# Pres. Worthington 2 stage Belted.

Rotary Con. & MG Sets (3 ph. 60 cy.)

300 KW G.E. HC 12 Rotary 275 v. 6 ph.
150 KW Ridgway 275 v. 900 RPM dir. con. 225 HP Ridgway Syn. Motor 2300 v. complete.
150 KW 250 v. Cr. Wh. 600 RPM dir. con. 200 KVA 440/220/3/60 West. Syn. Motor.
125 KW G.E. 250 v.—190 HP G.E. 1-K 440/220 v. Std. Factory unit.
100 KW Westgh. 250 v. Belted 150 HP Westgh. Syn. 440/220.
100 KW Ridgway, 250/275 v.—150 HP Ridg. Syn. 220/440 v. 1200 RPM with AC & DC Panels.

SLIP RING & SQ. CG. MOTORS

HP	Make	Speed	WDG	Type
300	West.	1750	S.R.	CW
200	G.E.	600	S.R.	I M
100	West.	1750	S.R.	CW
100	G.E.	500	S.R.	MI-25 cy.
50	West.	1750	S.C.	CS
50	G.E.	600	S.R.	MT
40	G.E.	600	S.R.	MT
40	G.E.	900	S.R.	MTC

SYNCHRONOUS MOTORS

HP	Make	Speed	Voltage
150	West.	600	440/220

TRANSFORMERS

Qu.	KVA	Make	Pri. V.	Sec. V.
1	.5	Al Ch.	2200	110/220
1	5	Pgh.	2200	110/220
2	7½	Al. Ch.	2200	110/220
25	7½	G.E.	2200	110/220
24	7½	Westgh.	2200	110/220
2	25	Pgh.	2200	110/220
1	37½	Wagner	2200	110/220
3	50	Pgh.	2200	110/220
3	50	G.E.	22000	2300

DC Motors and Generators 230/250 V.

HP	Make	Speed	WDG	Type
175	G.E.	475	ser.	MD 109
150KW	Cr. Wh.	550	cp.	
130	G.E.	550	ser.	CO 1812
100	G.E.	480	ser.	MD 108
100	West.	625	cp.	S
100	West.	670	sh.	S
75KW	West.	1000	cp.	S
55	West.	950	cp.	S
50	Reliance	1500		185T
40	Roth	1500		SK 80L
25 (2)	West.	875	ser.	K 5
20	West.	750		SK
15	Cr. Wh.	800	sh.	CM
15	West.	560	cp.	S
7½	G.E.	825		CYC
7½	New West. Vert.	1750	sh.	SK 284
3	New G.E.	1150	cp.	B 251

HOISTS

100—HP Lidgerwood sgl. fr. drum geared to 100 HP G.E. slip ring 220/440 v. 3 ph. 60 cy. MTC. Rev. drum & resistance.
40 HP Lidgerwood sgl. fr. drum geared to 40 HP G.E. slip ring 220/440 v. 3 ph. 60 cy. MTC. Rev. drum & resistance.
30 HP Carlin double dr. fr. 13" x 18"—5½" figs.
10 HP Hoist sgl. fr. dr. 22" Face 12" dia. 7" figs. dir. con. 10 HP AC Motor.
The above Hoists can be equipped with AC or DC Motors.

PUMPS

100 GPM 325' Head F.M. 2" suc. 1½" dis. dir. con. 15 HP F.M. 220/440 v. 3600 RPM Motor.
2—400 GPM 170' Head Lea Courtenay 4" suc. 4" Dis. dir. con. 40 HP AC or DC Motor.
500 GPM 135' Head Janesville 4" suc. 3" dis. dir. con. 20 HP 230 .v DC Motor.
700 GPM 160' Head DeLaval 6" suc. 6" dis. dir. con. 50 HP AC or DC Motor.

MOORHEAD-REITMEYER CO., INC. **Mayflower 7900** **Pittsburgh 19, Penna.**

Serving the Coal Industry for more than a Quarter of Century

ROTARY CONVERTERS

500 KW G.E. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
500 KW AL-CH SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
300 KW G.E. SYN. 575 V., HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 Transformers.
150 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Bracket Type, 2300/4000 V. Transformers.

MOTOR GENERATORS

300 KW G.E., SYN. 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Semi-Automatic Switchgear.
300 KW G.E., SYN. 275 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Semi-Automatic Switchgear.
150 KW WEST. SYN., 600 V., 2300/4000 V., 3 Ph., 60 CY., 1200 RPM, Manual Switchgear.

LOCOMOTIVES

13-T WESTGHSE., 250 V., 908-C Mts., 36"-44" Ga.
13-T WESTGHSE., 500 V., 908-C Mts., 36"-44" Ga.
13-T GOODMAN, 500 V., 36-B Mts., 36"-42" Ga.
10-T WESTGHSE., 500 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHSE., 250 V., 907-C Mts., 36"-44" Ga.
8-T WESTGHSE., 250 V., 906-C Mts., 36"-44" Ga.
8-T GEN. ELEC., 250 V., 839 Mts., 36"-48" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY
INCORPORATED
501 Grant Building Pittsburgh, Pa.

FLORENCE MACHINERY & SUPPLY CO.
COAL MINE EQUIPMENT & SUPPLIES

PUMPS - TRIPLEX

2—3½x4 Deming
2—4x6 Deming
2—5x6 Deming
1—5x10 Deming

ELECTRIC HOISTS

1—200 H.P. Double Drum Shaft Hoist, with Motor & Auto. Control Panel
1—52 H.P. Single Drum, with Motor
1—25 H.P. Single Drum, with Motor
1—15 H.P. Single Drum, with Motor
1—7½ H.P. Single Drum, with Motor

TRANSFORMERS

1—3 KVA G.E., 550-110/220
1—5 KVA West., 440-110/220
1—7½ KVA G.E., 1150-2300-115/230
1—10 KVA Gregory, 440-110/220
3—50 KVA G.E., 13200/2300
3—50 KVA G.E., 13200-12000-230/460
3—75 KVA G.E., 13200-2300/4000Y (New)
3—100 KVA West., 13800-460/230/115

LOADERS

1—7-BU Joy Loader, 250 Volts DC
1—Joy Elevating Ramp, 250 Volts DC
1—Manierre Type Box Car Egg Loader
1—Manierre Box Car Lump Loader

COAL CUTTERS

1—Goodman Universal, 250 Volts DC
1—Goodman Standard, 250 Volts DC
1—29-LE Jeffrey Coal Cutter, 250 Volts DC, mounted on Joy Cats
5—CE-7 Sullivan, 220 or 440 Volts AC

PIT CARS

135—1 Ton R. B. Card, 36" Ga.
119—1 Ton P. B. Card, 36" Ga.

MISCELLANEOUS

1—30 H.P. Slip-Ring Motor, 1200 RPM, with Cont. & Grids
1—6 Ton Trolley Locomotive, 36" Ga.
1—8 Ton Trolley Locomotive, 36" Ga.
3—Double Deck Mine Cages
10—Tons 85# Rail
Plate Frogs & Switches—12# to 40#

We have a complete stock of practically everything
Write for Stock List No. 8

904 EQUITABLE BLDG. **DENVER 2, COLORADO**
Yards: Denver & Florence

SEARCHLIGHT SECTION

LOCOMOTIVES

Goodman: All 250 volts.
1—6 ton, 30B, 43" 1—5 ton.
1—5 ton, W-1-2, 36".
2—5 ton, 2600 K.
2—6 ton, 33-1-4-T.
2—8 ton, 32-1-4-T.

Westinghouse: All 250 volt.
1—4 ton, 902, 48".
4—904 c. 44" 500 volt and 250 volt. Also 906 motors and 102-904-115.
1—10 ton, 915, and 907.
Bar steel frames 10 ton, 6 ton, and 4 ton.

G.E.: All 250 volt. 4 ton 1022, 44", as is
6 ton 803, 44" as is 5 ton 825, 44" & 36"–
6 ton 823, 44" 8 ton 839 motors
6 ton 801
8 ton 839
Battery Locomotives G.E., Ironton, Atlas. Whitcomb and 1½ ton Mercury.

Jeffrey: 6 ton and 4 ton, all gauges, 250 volt. 8 ton, 250 and 500 volts, 10 ton. MH78—13 ton MH110, 500 volts.

MINING MACHINES

Jeffrey: 35B and 4—28A, 250 V. 4—29B, 29C, 29CE with shearing head. Also I on cats. Revolving head for 29C.
35BB **Jeffrey** mining machine.
1—35 BB AC 220 volt.

Goodman, 12A, 12AB, 12AA, 12G3A, 24B.
1—12 13 220 volt and 2—112 DA. 500 volt.
2—Permissible Type 12CA. 6—112AA.
2—124 E.J.
Motors for 212AA, both 250 and 500 v.

Sullivan, CE7, CE9, CE10, CR10 Low Vein. CR5 for middle cutting.

SUBSTATIONS—275 volts, D. C.

2—150 KW **West.** Rotary.
1—200 KW 1—100 KW **Ridgway** M-G Sets.
2—100 KW **G.E.** Rotary.
1—200 K **Westinghouse** M-G Set 900 RPM, 2300-270 volt.
1—100 KW **Westinghouse** M-G Set.

SPARE ARMATURES

Jeffrey MH 110, MH 78, MH 73, 29B, 35B and 28A. **Goodman** 34B, 30B, 30C, 12A, 2600 K and R, 12AB, 12AA, 33-I-4-T, 31-I-4-T, 32-I-4-T. **General Electric** 801, 803, 807, 819, 821, 825, 839. **Westinghouse** 904, 905, 906, 102, 907, YR2, 115. Also 200 KW **Westinghouse Rotary Converted Armature,** 250 V Bracket Type, 150 KW G. E., HCC Bracket Type, and 150 KW G. E., TC Pedestal Type. **Sullivan** CE6, CE7, CE9 and CE10.

AERIAL TRAMWAYS • HOISTS • PUMPS • MOTORS • TRANSFORMERS • BOND WELDERS • RESISTANCE • COMPRESSORS • DUMPS • SPEED REDUCERS FIELD FRAMES • ARMATURES • GOODMAN HYDRAULIC SHOVELS • MOTOR STARTERS AND CONTROLLERS—AC & DC • DROP BAR SUPPORTS (Goose-neck), 29B and 29C • MINING MACHINE TRUCKS • SWITCHBOARDS • CIRCUIT BREAKERS—AC & DC • COAL CRUSHERS (double roll) 12"x16", (single roll) 24"x36", 24"x24" • LATHES, SWITCHES • AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps • MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps • HOISTS, overhead, AC 3-60-440, 1 ton and 2 ton • 1 clam shell bucket 1¾ cubic yard • MINE CARS • 2 SULLIVAN BIT SHARPENERS • R. R. SWITCHES 85# to 100# GENERATORS DC 250-275 volt, 30 KW to 100 KW. Also SPARE MOTORS DC and AC for mining machines and locomotives. BELT CONVEYORS, SLATE, LARRY. 2—14BU Joy Loaders, 250 v. on Cats. 2—5BU on Cats. 1—8BU on Cats. 2—Myers-Whaley, #3 and #4 Automatic and other loaders. DIESEL POWER PLANTS, 50 KW to 250 KW

GUYAN MACHINERY COMPANY, Logan, W. Va.

LOCOMOTIVES

1—4 ton Jeffrey, type MH-96, 250 volt, 44" gage, with cable reel
1—5 ton Goodman, 250 volt, type 2600-R, 42" to 48" gage, with reel
1—6 ton Goodman, 250 volt, type 30-C, 42" or 44" gage, with reel
1—10 ton Jeffrey, 250 volt, type 66, 44" gage. Spare armatures for 30-C, 30-B, and 32-0-4-T locomotives, and 1-MH-96, and 2-MH-78 Jeffrey's

CUTTING MACHINES

1—29-C Jeffrey Arcwall, 250 volt, any gage
1—29-B Jeffrey Arcwall, 250 volt, any gage
1—28-A Jeffrey Shortwall, 250 volt, any gage
2—112-AA Goodman Universals, 250 volt, with or without trucks
1—CR-2 Sullivan Shortwall, 250 volt, low vein
1—CE-7 Sullivan Shortwall, 250 volt
2—35-L Jeffrey Shortwalls, 220/440 volt, AC
3—Sullivan 7-AU cutting machines

SUBSTATIONS

1—80 KW Westinghouse MG set complete, 250 volt DC, 2300 volt AC

1—75 KW GE MG Set Comp. 2300 AC, 275 volt DC

1—200 KW GE Rotary Converter, 275 volt DC

MISCELLANEOUS

7—Goodman, type 65-A Pit car loaders, 250 volt

3—Jeffrey, type 58-C Pit car loaders, 250 volt

44—Low vein mine cars, 44" track gage

10—300 and 400 ampere welding machines, GE, Hobart, and Lincoln

Many other items in stock—Used and rebuilt

We solicit your inquiries

ALL-STATE EQUIPMENT CO.

LOGAN, W. VA. *Phone 884*

MINE HOISTS

1—Thomas 24" dia. Drum with 50 H.P. Motor & Control
1—Ottumwa 36" dia. Drum with 75 H.P. Motor and Control.
1—Wellman, Keyed Drum, 60" Dia. will coil 4500 ft. 1" rope, 200 or 300 H. P. Motor with Magnetic Control.
1—Vulcan, Shaft Hoist, 72" Dia. Suitable 300 ft. Shaft. Motor with control to suit requirements.
1—Nordberg, Shaft Hoist, 72" Dia. Suitable 200 ft. Shaft. 150 H.P. Motor with Control.
1—Vulcan, Cylindro-Conical, Shaft Hoist. Drum 7'-9' Dia. Suitable 350 ft. Shaft. 400 H.P. Motor with Control.

Other Hoists Available to suit all mining conditions.

JONES MINING EQUIPMENT CO.
Empire Building, Pittsburgh 22, Pa.

AIR COMPRESSORS:
12—Belted 360, 676, 870, 1000, 1300 ft.
12—Diesel 105, 315, 520, 676 & 1000 ft.
6—Electric 1300, 1500, 2200, 5000 ft.

RUBBER CONVEYOR BELTS:
1000', 60". 600', 30". 300', 20". 1000', 42". 900', 48". 1450', 36". 1200', 24". 900', 18". 600', 16". 350', 14".

ELECTRIC LOCOMOTIVES
15—3, 5, 8 ton Battery & Trolley.

DIESEL GENERATORS:
12—100, 150, 180 & 480 KW.

MINE LOADERS:
17—GD9, Eimco 21, Conway 20, 50, 60 & 75 and Sullivan HL3.

STEEL TANKS
30—8000, 10,000 & 20,000 gallon capacity.

SHOVELS—DRAGLINES:
7—1 yd., 1½ and 2 yd. Gas & Diesels.

R. C. STANHOPE, INC.
60 E. 42nd Street New York 17, N. Y.

WESTINGHOUSE
TYPE SK—MOTORS
America's Best Stock
WIRE INQUIRIES COLLECT

MOTORS, GENERATORS, TRANSFORMERS BOUGHT & SOLD

For prompt action, wire specifications collect
ELECTRIC EQUIPMENT CO.
63 Curlew Street • Box 51 • Rochester 1, N.Y.

This Searchlight Section
of COAL AGE

is an index of reliable sources for Used and Resale coal mining equipment now available. Consult the *Searchlight Section* in following issues for later offerings.

If you don't see what you want—ask for it. Ask the advertisers. Dealers are constantly adding to their stocks and may have acquired just what you need. Or, shall we ask them for you?

And, when you have special items to dispose of dealers will be glad to know of it or you can use this Searchlight Section to contact user-buyers direct, if you prefer. Send a list of your equipment and we will gladly give full space and rate information.

Classified Advertising Division
COAL AGE
330 W. 42nd St., New York

Electrical Equipment

Converters, Motor Generator Sets, A. C. & D. C. Motors, Control Equipment and Transformers.
We build equipment to fit your requirements. Over 25 years engineering background.

C. B. LOCKE CO.
P. O. BOX 3227
TEL. 38-136
CHARLESTON W. VA.
NEW and REBUILT

FOR SALE

1—GE-7 Sullivan Shortwall Machine 220 Volts D.C.
1—56 KW. M.G. Set 250 Volts D.C. 220 Volts A.C.
1—2 in. Centrifugal pump, 115 ft. head, 220 Volt A.C.

KNICKERBOCKER-McSPARIN COAL CO.
Carrier Mills, Illinois

FOR SALE

2 Sullivan 7 B shortwall undercutters—1, 50 hp. 440 volt A.C., 1, 50 hp. 250 volt D.C. with accessories.

E. G. KRESS
CERTAIN-TEED PRODUCTS CORP.
120 So LaSalle Chicago 3, Ill.

STRIPPING CONTRACTORS—

"PAY-AS-YOU GO"

Call Us "Collect"

for

Shovels, Draglines, Cranes, Tractors, Trailers

and Other

Heavy Coal-Stripping Equipment

ECONOMY Co., Inc.

49 Vanderbilt Ave.

New York 17, N. Y.

Telephones:

MUrray Hill 4-2294-8292-2295-2296

FOR

IMMEDIATE DELIVERY

OF

RUBBER PRODUCTS

Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

CALL, WIRE or WRITE

CARLYLE

THE RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

Inquire For Prices - Mention Size and Lengths

PROTECT THAT PLANT
FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY

RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
	50 "	8.00
1"	25 "	6.25
	50 "	12.00
1¼"	25 "	7.50
	35 "	10.50
	40 "	12.00
	50 "	15.00
1½"	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., Inc.

62-66 PARK PLACE NEW YORK, N. Y.

RECTIFIER

Mercury Arc Rectifier, Brown-Boveri (Allis-Chalmers), complete with 3/6 phase, 60 cycle transformer and switchboards. Rated 500 Kw at 600 volts DC, or can be re-rated a lower capacity for 275 volts DC.

OTHER MATERIAL

New and rebuilt AC & DC motors in stock; also control; 100 & 200 Kw rotary converters; 7 x 7" I-R Air Compressor (with or without 42" gauge track wheels); 5-ampere house meters; West. type CO AC inverse time overload relays; knife switches; safety switches, etc.

R. H. BENNEY EQUIPMENT CO.
5024 Montgomery Rd., Norwood 12, Ohio
Better Known . . . Known to be Better

LATHES

36" x 18' Putnam Grd. Hd. Q.C. Lathe.
36" x 24' Putnam Grd. Hd. Q.C. Lathe.

RADIAL DRILLS

6' American Triple Purpose, M.D.
6' Cincinnati Bickford Radial M.D.
7' Cincinnati Bickford Radial M.D.
5' American Triple Purpose Plain.

CINCINNATI MACHINERY & SUPPLY COMPANY
218 E. Second St., Cincinnati, Ohio

FOR SALE

HOISTS

1—Ottumwa Electric hoist, single rigid-cylindre-conical drum, with automatic control. Weight of cage 7000#, weight of car 2500#, weight of coal 6000#, lift 310', diameter of rope 1¼". Diameter of drum 60"x84". Brake, 84" diameter, 8" face, post type, oil operated. Drum shaft bearings 10"x20". Hoist is equipped with single reduction gears 19 and 229 teeth, 2½ D.P. 11" face. The drum has five grooves on the 60" diameter, 11 grooves up the cone, 4 grooves on the 84" diameter. The drum has a rope capacity of 326 feet plus three dead turns. The hoist is equipped with a 200 HP motor.

MINING MACHINES

1—Goodman Universal Shortwall mining machine, 112DB, DC, 250 volts, Cincinnati Duplex chain, 6' cutter bar. Has new extra armature. 36" or 42" gauge.

3—Goodman Longwall mining machines, DC, 36" or 42" gauge.

6—Jeffrey 35A Shortwall mining machines, 50 HP motors, 250 volts, DC. 6' cutter bars, 36" or 42" gauge.

2—Sullivan CE-7 Shearing Machines, 250 volts, DC. 7 ft. cutter bars, 36" or 42" gauge.

1—Sullivan CE-7 Shearing machine, AC, 220 volts, 3 ph, 60 cy, 7 ft. cutter bars, 36" or 42" gauge.

1—Sullivan CE-7 Shortwall mining machine, AC, 220 volts, 3 ph, 60 cy, tip-turn truck, 7 ft. cutter bar, 36" or 42" gauge.

2—Sullivan Longwall mining machines, AC, #2991, #7061.

LOCOMOTIVES

3—Goodman 5 ton locomotives, type W1-2A5, 36" or 42" gauge. One is complete with electric reel.

2—Goodman 6 ton ball bearing locomotives, type 3314T, 36" or 42" gauge.

CRUSHERS

2—Jeffrey Crushers, single roll, size 30x30.

1—American Pulverizer Company crusher, size 31"x36" Ball Bearing type S. Serial No. 1290, No. 24 driven by AC motor enclosed. Fan ventilated type direct connected to crusher by coupling motor, 30 HP, 600 RPM, 440 volts 3 phase, 60 cycle.

1—American Pulverizer Rolling Ring Crusher No. 24. Serial 1030, size 44x38. This crusher has a sub-base and a flexible coupling. No motor. Crushes from 20" down to ¾".

BOX CAR LOADER

1—Ottumwa new type box car loader. Will load coal from tipple into box car.

STEEL TIPPLES

1—Tipple and shaker constructed by Allen and Garcia Company. Capacity 3000 tons daily.

Have new and second hand rails and track accessories.

We are distributors for John A. Roebling Sons Company wire rope and fittings.

GAVENDA BROTHERS
CANTON, ILLINOIS

PIPE—MACHINERY—GAS ENGINES
AIR COMPRESSORS—DIESELS—PUMPS
Some Steam Engines and Boilers available only slightly above the metal price
BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO Near Toledo

IRON and STEEL PIPE
New and Used
Large stocks, all sizes
attractive prices
L. B. FOSTER COMPANY
P. O. Box 1647 Pittsburgh 30, Pa.

PIPE New & Reconditioned
ALL SIZES for ALL PURPOSES
Cut and Threaded to Your Specifications
VALVES AND FITTINGS
UNITED PIPE & SUPPLY CO. Department 110 NORRISTOWN, PA.

FOR SALE
GIRDERS
8—39' 8" x 72" Steel Girders
These girders are in excellent condition.
GLAZER STEEL CORPORATION
610 Chamberlain St. Tel. 3-0738
KNOXVILLE, TENN.

WANTED

WE WILL SELL
Link-Belt K48 Dragline
and take as part payment good shovel ⅜ to 1½ yard capacity.
FS-349, Coal Age
330 West 42nd St., New York 18, N. Y.

We Will Buy

WE WILL BUY
MOTORS — AC & DC
GENERATORS
MG SETS
TRANSFORMERS
Controls &
Switchboards
Air & Oil
Circuit Breakers

ELECTRIC GENERATOR & MOTOR CO.
4523 Hamilton Ave.
Cleveland 14, Ohio
Phone ENdicott 5656
Established 1900

WANTED
1—Joy Junior Loader for operation on 250 volts, D. C. current, quote price, details of condition and where available for inspection.
EARL MERRICK
Waynesburg, Ohio.

FOR SALE
From Coal Mining Company
several Jeffrey L400 coal loading machines, 42" guage, 250 volt. D. C. Good operating condition with ample spare parts.
FS-355, Coal Age
330 West 42nd Street, New York 18, N. Y.

WANTED TO BUY
DRAGLINE SHOVEL
Diesel powered complete with 5 yd. to 15 yd. bucket.
W-356, Coal Age
330 West 42nd St., New York 18, N. Y.

FOR SALE
100 KW GE 250v DC Generator
Complete with Switchboard.
Jeffrey Pit Car Loader—A1 Condition
Makes good Elevating Conveyor
MID-CONTINENT COAL AND COKE CO.
Sturgis, Kentucky

WANTED—TO BUY
2—#7-BU Joy Loading Machines for operation on 250 volts D.C. current, used but rebuilt to first-class operating condition. Quote price, f.o.b. point, details of condition, where available for our inspection, and when shipment could be made.
W-354, Coal Age
520 N. Michigan Ave., Chicago 11, Ill.

EMPLOYMENT . . . EQUIPMENT . . . BUSINESS
OPPORTUNITIES
Whatever your need—
think "SEARCHLIGHT" FIRST

REBUILT EQUIPMENT—READY TO SHIP

MOTOR GENERATOR SETS

1—100 KW 720 rpm. 250 v. West Gen. dir. con. 2200 v. 3 ph. 60 cy. motor.
1—75 KW 850 rpm. 250/275 v. DC type DLC General Electric Gen. dir. con. to 100 HP 850 rpm. 220 or 440 v. 3 ph. 60 cy. West. CCL Motor.
1—50 KW 250 v. DC Gen. dir. con. 220/440 v. 3 ph. 60 cy. AC Motor.
1—30 KW 250 v. DC cp.wd. Gen. dir. con. 220/440 v. 3 ph. 60 cy. AC Motor.
1—20 KW 250 v. DC 1200 rpm. G.E. Gen. dir. con. to 2200/440/220 v. 3/60 syn. motor.

MINE LOCOMOTIVE

1—5 ton Ironton Storage Battery Locomotive.

PUMPS

1—Amer. Piston Pump—5½x4½"—size 8x12.
1—48 GPM 161' hd. Roper 3" suc. 3" dis.
1—90 GPM 225 ft. head, 600 rpm. 2x2" Blackmer.
1—220 GPM 225 ft. head, 600 rpm. 3½"x3" Blackmer.
2—500 GPM Morris Machine Wks. 4" suc. 4" dis. 123' hd. 1760 rpm.
1—2000 GPM De Laval 170' head.
1—3000 GPM De Laval 144' hd. 150 HP.
1—3500 GPM DeLaval 130' hd. 1450 rpm.
1—4000 GPM DeLaval 90' hd. 1450 rpm.
1—4200 GPM DeLaval 200' hd. 1750 rpm.

SLIPRING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
400	Westg.	CW	2200	435
350	Westg.	CW	2200	900
260	Burke	EMV-65	440	600
50–60	Westg.	CW	220	1800
50	Chand.		220/440	1800
15	G.E.	I-8	440	845

230 V. DC MOTORS

HP	Make	RPM	Type
100	West.	300/700	SK
85	West.	500	M
80	West.	490	76A
75	G.E.	600	MP
25	Westg.	600	SK
25	G.E.	650	MD
20	Westg.	600	M
20	Westg.	1750	SK
20	West.	975	S
20	West.	1750	SK
15	Al. Ch.	800	
13	Cr. Wh.	1100	CM
10	Cr. Wh.	675	33M
10	Cr. Wh.	825	CM
5	Westg.	850	
5	Cr. Wh.	980	CM

ALTERNATING CURRENT MOTORS
3 ph. 60 cy.

HP	Make	Volts	RPM	Type
150	Wagner	440	1800	31V
100	Westg.	220/440	860	CCL
75	Triumph	220	685	B15
60	Westg.	220–440	1800	
50	G.E.	220	515	KT
50	Westg.	220	1200	CD
40	Westg.	440	1800	MS
25	G.E.	220/440	1800	I

MAGNETIC STARTERS

50—NEW 5, 7½, 10 and 15 HP 230 v. DC Cutler Hammer drip proof Magnetic Starters.

TRANSFORMERS

9	5	2200	110/220	G.E.& West.
85	7½	2200	110/200	G.E.& West.
16	10	2200	110/220	G.E.& West
21	15	2200/1100	440/220/110	West.
3	15	2200	110/220	Packard
3	15	2200	110/220	Cr. Wh.
2	20	1150/2300	115/230	Maloney
1	20	2300	110/230	West.
2	20	2200/1100	440/220/110	West.
2	25	2300	110/220	West.
6	37½	2300	240/480	G.E.
3	40	2200/1100	220/110	West.
1	40	1100/220	110/220	Pittsburgh
1	40	2300/1150	115/230	Maloney
2	50	2200	110/220	Packard
1	50	6600	550/440	Allis. Chal.
1	50	2200/1100	220/110	West.
2	50	2200/1100	220/110	Maloney
1	75	2400	240/480	G.E.
1	75	2400/4160Y	120/240	West.
3	100	2400	480	Allis Chal.
3	125	2200	220/440	G.E.
2	150	2200/2300/2400	220/230/240	G.E.
3	250	6600/5940	2300	West.

COMPRESSORS

2—315 CFM Ingersoll Rand portable 100# pres. driven by 105 HP Waukesha Oil Engines, 860 rpm.
1—150 cu.ft. 100# pressure National Brake & Electric Compressor direct driven by 30 HP 220 or 440 v. 3/60 motor with control.

DIESEL ENGINE GENERATOR SET

1—50 kw. 250 v. DC Gen. dir. conn. to 65 HP Primm Diesel Hor. Engine.

MINE FANS

6—15,000 cu. ft. Clarage Fans 10 HP motors.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

RAILS NEW AND RELAYING

TRACK ACCESSORIES

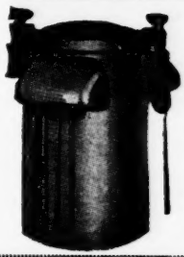
from **5** *Warehouses*

- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE

L. B. FOSTER COMPANY
PITTSBURGH • CHICAGO • NEW YORK

—TRANSFORMERS—



3—667 KVA 6930/12000Y—2300 V.
3—500 KVA 13800—2300 V.
9— 50 KVA 4160—240/480 V.
3—37½ KVA 33000—13200 V.
3—37½ KVA 11000/22000/33000—2300 V.

One Year Guarantee

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M Since 1912 CINCINNATI 27, OHIO

SPECIAL

For Quick Sale

RELAY RAIL

240 - 67# Rails, 30'-33' Lengths
280 - 70# " 33' Lengths
185 - 75# " 30'-33' Lengths
270 - 85# " 30'-33' Lengths

HEADERS & PROPS

600 - 75# Rails, 12'-15' Lengths
184 - 85# " 18'-20' Lengths
Some 70# Switch Points & 85# Frogs

Price, $26.75 net ton, upon inspection only.

GLAZER STEEL CORP.
610 Chamberlain St. Knoxville, Tenn.
Phone 3-0738

For Immediate Delivery

1—680 KW NORDBERG UNAFLOW Engine Generator SET: Left hand, non-condensing, 3/60/440.
1—750 KW NORDBERG Corliss Engine Generator SET: non-condensing, 3/60/440.
1—27 Ton Standard Gauge, Baldwin Saddle Tank LOCOMOTIVE.
1—62 Ton American-Consolidation Standard Gauge LOCOMOTIVE, ICC.
14 MILES RAIL.

Machine Shop, Blacksmith Shop, Motors, Tools, Supplies, etc.

WIRE - WRITE - PHONE
Send for Printed Circular

NEWBERRY MANUFACTURING CO.
P. O. Box 295 Newberry, Michigan
Telephone Newberry 16

MINING MACHINES

AC Ib DC

REBUILT & GUARANTEED FOR IMMEDIATE SHIPMENT

COAL CRUSHERS
Single & Double Roll
Electric Coal Drills, Mine Fans, etc.
Ironton 5-ton Storage Battery Locomotive 36" or 42" Gauge, with or without batteries
CONVEYORS—Belt and Drag
Equipment of all kinds
Buy, Sell or Exchange

THE INDUSTRIAL EQUIPMENT CORP.
705 First National Bank Bldg.
Pittsburgh 22, Pa.
Warehouse: Carnegie, Pa.

RELAYING RAIL

TRACK ACCESSORIES

MIDWEST STEEL CORP.
Gen. Off.: CHARLESTON, 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

CONVEYOR CHAIN

1000 Ft. of NEW 9" pitch Webster W. S. 933P chain 2½" x ⅜" side bars—3" bushed white iron rollers and hardened steel bushings with ⅞" O.D. pins, also Sprockets and Take ups.

R. J. FLIGHT
1303 West 103rd St. Cleveland, Ohio

RAILS — CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

M. K. FRANK
480 Lexington Ave. New York, N. Y.
810 Park Bldg., Fifth Avenue Pittsburgh, 22, Pa.
Reno, Nevada Carnegie, Pa.

BONDED SCALES
VIBRATING SCREENS
CRUSHERS

20 ton, 24' x 10' Truck Scale	$575.00
20 ton, 34' x 10' Truck Scale	815.00
3 ton tipple scale	135.00
3' x 6' Single Deck Screen	495.00
3' x 8' Double Deck Screen	685.00
3' x 8' Triple Deck Screen	885.00
Double-Roll Coal Crusher	345.00
Large Coal Crusher	795.00

Immediate Shipment—Terms

BONDED SCALE COMPANY, MFRS.
2190 S. Third St., Columbus 7, Ohio
Phone Garfield 1651—Eve. University 2832

FOR SALE

Hoists—5 HP to 150 HP.
1—Air Hoist 7½ HP.
4—Westinghouse 904—6 ton Locomotives, Bar Steel Frames, Motor driven crabs—500 volts, but can be used on 250 volts or can parallel motors—bargain price—also extra armatures.
1—4 Ton Jeffrey Locomotive. Also
10—Jeffrey Blowers # 60 with 1½ HP SK motors, 250 volts
1—Doodlebug Goodman Locomotive
1—Low-vein Sullivan Machine (late type)
1—29C Jeffrey Track and Caterpillar mounted
Also 2—G.E. 100 K.W. M.G. Sets—Induction motors—2200 volts—250 V.D.C. G.E.

GUYAN MACHINERY CO.
Box 150, Logan, West Virginia

1—Jeffrey 36B Longwall machine 250 volts DC.
1—Vulcan hoist 100 HP., 440 volts, 3 phase.
5—Battery locomotives, 36" Gauge.
2—Jeffrey 35L Shortwall low vein machines, 220/440 volts AC.
4—Jeffrey 24B Longwall machines 250 volts DC.
1—Sullivan CR2 shortwall machine 250 volts DC.

BERRETTINI ELECTRIC CO.
378 N. Main St., Plains, Pa.

SURPLUS ARC WELDERS

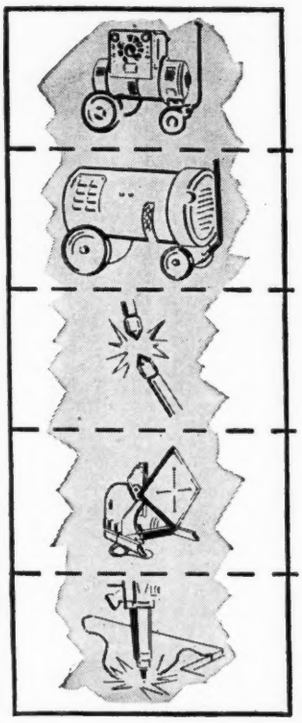


Here is a chance to pick up arc welding equipment in any desired quantity at low cost. Large quantities of 300 to 400 ampere MG type welders—primarily of Lincoln and Hobart make—are available for sale. Largest inventories are in the Boston, Detroit, Cleveland, Chicago, Atlanta, Nashville, Houston and Philadelphia offices of War Assets Administration. They may be obtained, however, by contacting any of the War Assets Administration offices listed below. Equipment from 200 to 400 amperes in DC, gasoline-engine driven and AC sets are available in smaller quantities . . . also multiple operator types and related equipment such as electrodes, welding rods, weld positioners and flame cutters. Spot, seam and flash welders are likewise available. The equipment is for both production and construction. Write, wire or phone your War Assets Administration office today.

ALL ITEMS SUBJECT TO PRIOR SALE

LINCOLN DC Type: 300 to 400 amperes

This and many other types and makes of welding machines and related equipment are available from war surpluses.



HOBART
Standard models of this make available in large quantities and most ratings.

WESTINGHOUSE
Portable models available in limited quantities.

RESISTANCE WELDERS
Spot, seam, butt and flash type welders for production operations—also portable or gun types.

WELD POSITIONERS
Many sizes and capacities, including head and tailstock combinations.

FLAME CUTTERS
Both single and multiple torch types, portable and stationary.

FREE FACTS

TO WAR ASSETS ADMINISTRATION:
Please send me information on availability, condition and location of the following types of equipment:

- ☐ HOBART ARC WELDERS
- ☐ LINCOLN ARC WELDERS
- ☐ WESTINGHOUSE ARC WELDERS
- ☐ .....ARC WELDERS
- ☐ ..... (other equipment)
- ☐ RESISTANCE WELDERS (spot) (seam) (flash)
- ☐ FLAME CUTTERS
- ☐ WELD POSITIONERS (capacity).....
- ☐ WELDING ROD OR ELECTRODES

Name.....

Firm.....

Address.....

City.....*State*.....

176-1

VETERANS OF WORLD WAR II

To help you in purchasing surplus property, veterans' units have been established in each War Assets Administration Regional Office.

WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

173-1

HOW TO GET BRASS MILL PRODUCTS!

BRASS, BRONZE AND COPPER... Rod, Bar, Sheet, Strip, pipe, tubing, and wire in Production Quantities.



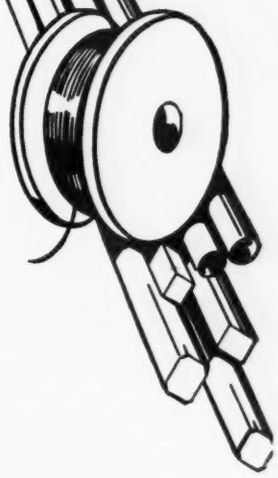
GOVERNMENT-OWNED SURPLUS STOCK

in many standard and non-standard grades, finishes, sizes and specifications AVAILABLE NOW in production quantities

—and new surplus declarations are being made daily.



EASY TO FABRICATE... This stock may be fabricated by normal production methods.



HOW TO PURCHASE

1. Estimate, for any convenient period, your production needs in each specification, finish, gauge, etc.
2. Write, wire or phone that information to your nearest War Assets Corporation office* below. We will advise you of the location and condition of the stock you need, estimate possible delivery dates, quote prices and help arrange credit.
3. When satisfactory arrangements have been made, we will start shipments.

***WAR ASSETS CORPORATION** is a Reconstruction Finance Corporation subsidiary. When checking telephone and other directories, simply look up RFC.

VETERANS OF WORLD WAR II: To help you in purchasing surplus property from War Assets Corporation, a veterans' unit has been established in each of our Regional Offices listed below.

WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta · Birmingham · Boston · Charlotte · Chicago · Cleveland · Dallas · Denver Detroit · Helena · Houston · Jacksonville · Kansas City, Mo. · Little Rock · Los Angeles · Louisville Minneapolis · Nashville · New Orleans · New York · Oklahoma City · Omaha · Philadelphia Portland, Ore. · Richmond · St. Louis · Salt Lake City · San Antonio · San Francisco · Seattle · Spokane Cincinnati · Fort Worth (Telephone 3-5381)

157-4

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1945-1946 *MINING CATALOG*

Acker Drill Co. ... 197
Acme Compressor Co. ... 168
*Allis-Chalmers Mfg. Co. ... 8, 9, 41
*American Brattice Cloth Corp. ... 184
*American Cable Div. of American Chain & Cable Co. ... Third Cover
American Car & Foundry Co. Insert between pp. 60–62
American Coal Sales Ass'n. ... 113
American Crucible Products ... 148
*American Cyanamid & Chemical Corp. ... 71
*American Hoist & Derrick Co. ... 185
American Manganese Steel Div. of American Brake Shoe Co. ... 152
*American Mine Door Co. ... 50
*American Pulverizer Co. ... 46
*American Steel & Wire Co. ... 18, 19
Anaconda Wire & Cable Co. ... 111
Ansul Chemical Co. ... 149
Armco Drainage & Metal Products, Inc. ... 190
Atlas Powder Co. ... 52

Bemis Bro. Bag Co. ... 176
*Bird Machine Co. ... 7
Bituminous Casuality Corp. ... 169
Bituminous Coal Institute ... 38, 39
Boston Woven Hose & Rubber Co. ... 45
Bristol Co. ... 170
Broderick & Bascom Rope Co. ... 157

Calcium Chloride Ass'n. ... 171
Cardox Corp. ... 33
Cement Gun Co. ... 174
Central Mine Equipment Co. ... 117
Centrifugal & Mechanical Industries ... 186
Chesapeake & Ohio Railway ... 6
Chicago Perforating Co. ... 197
*Cincinnati Electrical Tool Co. ... 195
*Cincinnati Mine Machinery Co. ... 126
Cleveland Cliffs Iron Co. ... 177
Coal Operators Casualty Co. ... 174
Coffing Hoist Co. ... 166
*Continental Gin Co. ... 191
Crane Co. ... 48
*Cummins Engine Co. ... 35

*Deister Concentrator Co. ... 158
*Dings Magnetic Mfg. Co. ... 179
Dobbins Mfg. Co. ... 180
*Dow Chemical Co. ... 190
Duff-Norton Mfg. Co. ... 185
*duPont de Nemours & Co., E. I. (Grasselli Division) ... 154
*duPont de Nemours & Co., E. I. (Ventube Division) ... 150

*Edison Storage Battery Div., Thomas A. Edison, Inc. ... 54
*Elastic Stop Nut Corp. of America ... 146
*Electric Storage Battery Co. ... 109
*Ensign-Bickford Co. ... 74
Euclid Road Machinery Co. ... 141

Fawick Airflex Co. ... 51
Firestone Tire & Rubber Co. ... 65
Flexible Steel Lacing Co. ... 191
*Flocker & Co., John ... 56
*Flood City Brass & Electric Co. ... 190
Flory Mfg. Co. ... 197

Gar Wood Industries, Inc. ... 53
Gates Rubber Co. ... 20
General Cable Co. ... 131
General Electric Co. ... 14, 15, 156
General Tire & Rubber Co. ... 143
*Goodman Mfg. Co. ... 16, 17
Goodrich Co., B. F. ... 1
Goodyear Tire & Rubber Co. ... 10, 11
*Gorman-Rupp Co. ... 153
Gould Storage Battery Co. ... 40
*Goyne Steam Pump Co. ... 196
Greensburg Machine Co. ... 176
Gulf Oil Corp. ... 25
Gulf Refining Corp. ... 25
Guyan Machinery Co. ... 170

Harnischfeger Corp. ... 192
*Hazard Insulated Wire Works ... 4
Hulburt Oil & Grease Co. ... 2, 3

I. T. E. Circuit Breaker Co. ... 66
Illinois Powder Mfg. Co. ... 133
Imperial Cantrell Mfg. Co. ... 167
*Independent Pneumatic Tool Co. ... 37
*Indiana Foundry Co. ... 193
International Harvester Co. ... 30

*Jeffrey Mfg. Co. ... Insert between pp. 20–25 63
*Jenkins Bros. ... 155
*Jones & Laughlin Steel Corp. ... 173
*Joy Mfg. Co. ... 72, 73

*Kennametal, Inc. ... 145
*Koehring Co. ... 44

*La-Del Conveyor & Mfg. Co. ... 135
*Leschen & Sons Rope Co., A. ... 163
*Link-Belt Co. ... Fourth Cover
Lubriplate Div. Fiske Bros. Refining Co. 193

Mack Trucks, Inc. ... 62
Macmillan Petroleum Corp. ... 159
Macwhyte Co. ... 181
Marion Steam Shovel Co. ... 28
Marolo Co. ... 184
Mayfair Hotel ... 185
McGraw-Hill Book Co. ... 194, 196
*McLanahan & Stone Corp. ... 197
*McNally-Pittsburg Mfg. Co. Insert between pp. 41–44
*Merrick Scale Co. ... 186
*Mine Safety Appliances Co. ... 161
Mining Catalogs ... 178
Morrow Mfg. Co. ... 47
*Mosebach Elec. & Supply Co. ... 176
*Mott Core Drilling Co. ... 183
*Myers-Whaley Co. ... 129

*Naylor Pipe Co. ... 160

Ohio Brass Co. ... 121
Oliver Corp. ... 165

Pangborn Corp. ... 162
Paris Mfg. Co. ... 164
*Pennsylvania Crusher Co. ... 195
Pettibone-Mulliken Corp. ... 55
*Pittsburgh Knife & Forge Co. ... 186
Post-Glover Electric Co. ... 60
Preformed Wire Rope Information Bureau ... 137
*Princeton Foundry & Supply Co. ... 168

Ready Power Co. ... 192
Reliance Electric & Engrg. Co. ... 175
Republic Rubber Div., Lee Rubber & Tire Corp. ... 70
Roberts & Schaefer Co. ... 119
Robins Conveyors, Inc. ... 58
*Rochester Ropes, Inc. ... 151
*Rockbestos Products Corp. ... 64
*Roebling's Sons Co., John A. ... 26, 27
Rome Cable Co. ... 125
*Ruberoid Co. ... 166

*Salem Tool Co. ... 148
*Sanford Day Iron Works, Inc. ... 68, 69
*Schramm, Inc. ... 147
Searchlight Section ... 197–205
*Simplex Wire & Cable Co. ... 31
Standard Oil Co. (Indiana) ... 32
Standard Pressed Steel Co. ... 193
Stearns Magnetic Mfg. Co. ... 182
*Stephens-Adamson Mfg. Co. ... 187
Stoody Co. ... 182
*Sullivan Machinery Co. ... 59

Sun Oil Co. ... Second Cover
Syntron Co. ... 192

Texas Co. ... 12, 13
Tide Water Associated Oil Co. ... 57
*Timken Roller Bearing Co. ... 49

Union Pacific Railroad ... 34
Unit Crane & Shovel Corp. ... 195
United States Rubber Co. ... 115, 123
*Upson-Walton Co. ... 36
*U. S. Steel Subsidiaries ... 18, 19

*Vulcan Iron Works (Wilkes-Barre) ... 29
Vulcan Iron Works (Denver) ... 191

*Walter Motor Truck Co. ... 67
Walworth Co. ... 139
Wedge-Bar Screen Co. ... 183
*Weir-Kilby Corp. ... 164
*Wickwire Spencer Steel Co. ... 194
*Willson Products, Inc. ... 179

■

PROFESSIONAL SERVICES ... 188

■

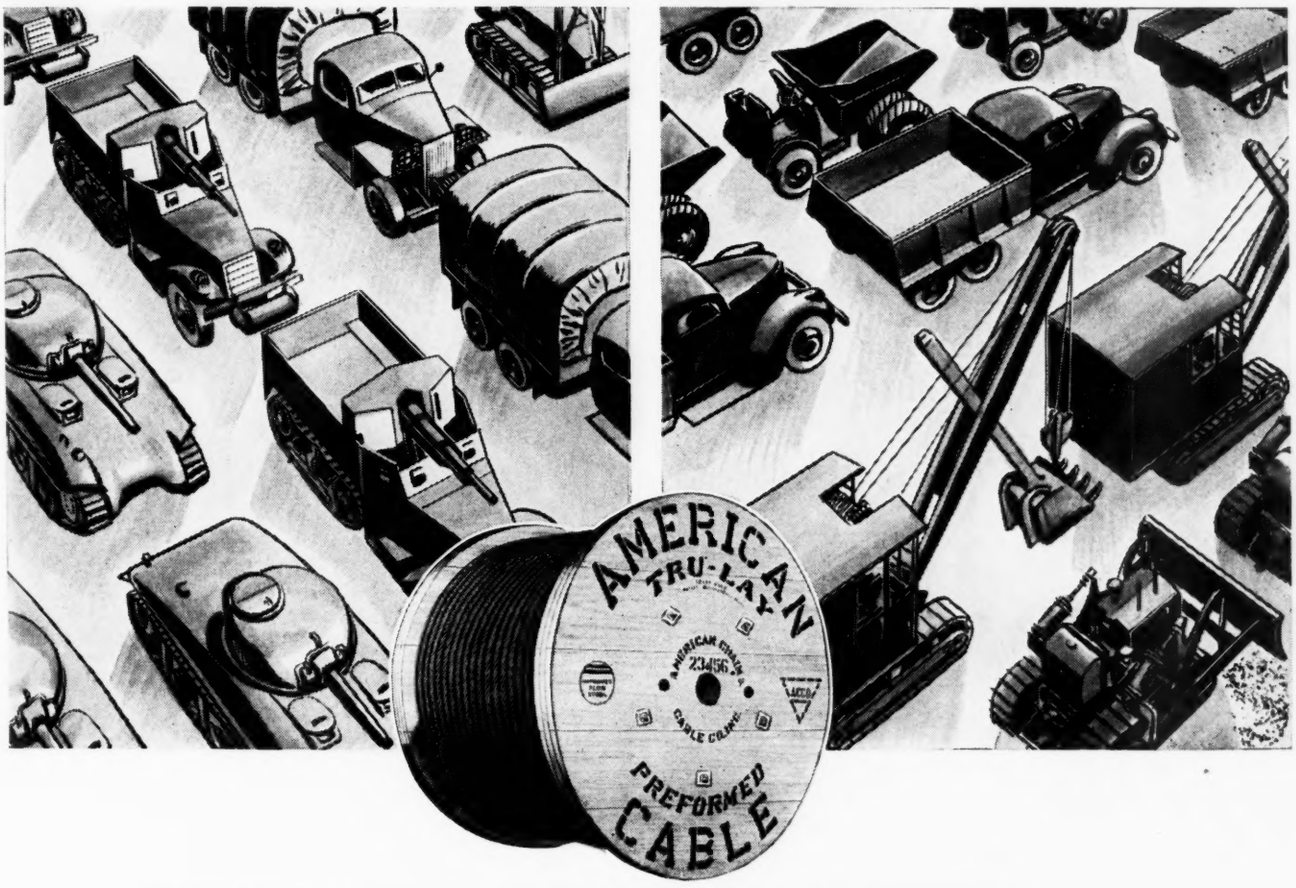
SEARCHLIGHT SECTION

Classified Advertising

EMPLOYMENT ... 197
BUSINESS OPPORTUNITIES ... 197
WANTED TO PURCHASE ... 202
USED AND SURPLUS EQUIPMENT 200–205

All State Equipment Co., Inc. ... 200
Benney Equipment Co., R. H. ... 201
Berrettini Electric Co. ... 203
Bonded Scale Co. ... 203
Bradford Supply Co., Inc. ... 202
Carlyle Rubber Co., Inc. ... 201
Certain-Teed Products Corp. ... 200
Cincinnati Machinery & Supply Co. ... 201
Coal Mine Equipment Sales Co. ... 198
Columbia Const. Co., Inc. ... 198
Crawbuck Co., John D. ... 198
Duquesne Electric Mfg. Co. ... 203
Economy Co., Inc. ... 201
Electric Equipment Co. ... 203
Electric Generator & Motor Co. ... 202
Electric Service Co., Inc. ... 200
Flight, R. J. ... 203
Florence Machy. & Supply Co. ... 199
Foster Co., L. B. ... 202, 203
Frank, M. K. ... 203
Gavenda Bros. ... 202
Glazer Steel Corp. ... 202, 203
Greensburg Machine Co. ... 198
Guyan Machinery Co. ... 200, 203
Industrial Equipment Co. ... 203
Iron & Steel Products, Inc. ... 198
Jones Mining Equipment Co. ... 198, 200
Kirk Co., Inc., Wallace E. ... 199
Knickerbocker-McSparin Coal Co. ... 200
Locke Co., C. B. ... 200
Mid-Continent Coal & Coke Co. ... 202
Midwest Steel Corp. ... 203
Merrick, Earl ... 202
Moorhead Reitmeyer Co. ... 199
Newberry Mfg. Co. ... 203
Stanhope, Inc., R. C. ... 200
Smith Co., H. Y. ... 198
Swabb Equipment Co., Frank ... 198
Tippins Machinery Co. ... 198
United Pipe and Supply Co. ... 202
United Electric & Machine Co. ... 198
War Assets Administration ... 204, 205
Wenneborg Coal Co. ... 197

a Plan for *NOW!*



3,000,000 jobs are now ready, thanks to the American Road Builders' Association. That organization sponsored a bill (now authorized by Congress) to provide one and one-half billion dollars of Federal money for road repair and new highway construction. To receive its share of these funds, each state must match its Federal request with a like amount of its own.

Here is a sound plan for putting returning veterans, and dislocated war workers to work on needed highway, bridge and airport construction. It will make work for millions more in durable and consumer goods industries. It will benefit all America by providing necessary facilities and helping stabilize our post-war economy. For full information regarding this vital plan get free copies of the illustrated booklets titled: "The Road Ahead" and "Put Your Town on the Air Map." Get them by dropping a card to the American Road Builders' Association, 1319 F Street, N.W., Washington, D. C.

ARMY E NAVY

ACCO

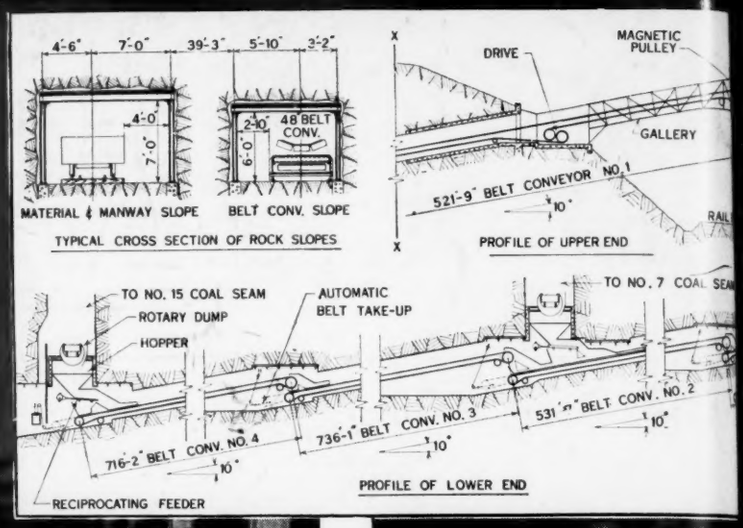
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Emlenton, Pa., Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.

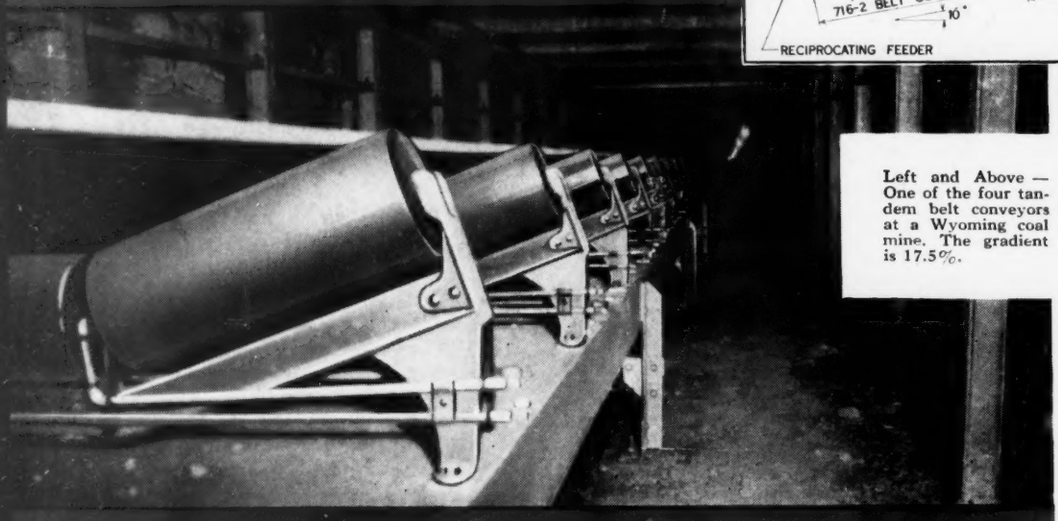
TRADE MARK

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

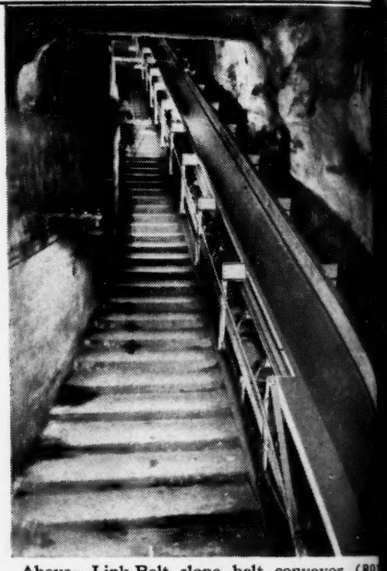
In Business for Your Safety

LINK-BELT CONVEYOR SLOPE HAULAGE

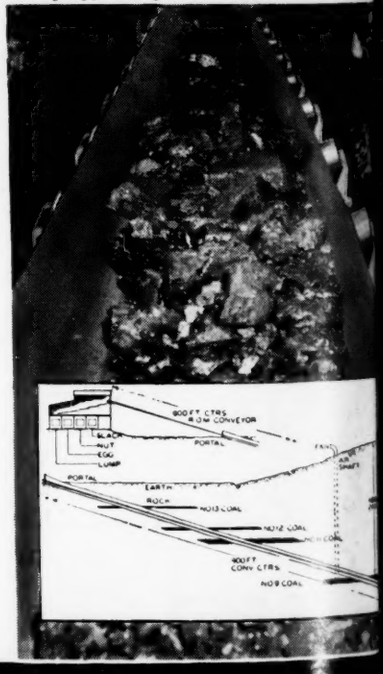




Left and Above — One of the four tandem belt conveyors at a Wyoming coal mine. The gradient is 17.5%.



Above—Link-Belt slope belt conveyor (89 mine bottom to preparation plant) Weirton Isabella, Penna. Below—900 ft. long Link- conveyor extending from a point 250 ft. bel on a 17° slope to the tipple at Louisville Gas Company, Cherry Hill Mine.



Continuous COAL FLOW → Boosts Output—Cuts Costs

Now — more than ever — you need the highest possible mine output at the lowest cost per ton.

Where it is applicable, Link-Belt Conveyor Slope Haulage has the advantages of high capacities . . . low-cost-per-ton of coal handled . . . uniform delivery . . . low maintenance cost . . . less wear and tear on mine cars.

Of an installation transporting 6,000,000 tons in a little over five years, (four 48" belts in tandem, 2600' from mine bottom to tipple), a mine executive said, "The performance of these conveyors has been most satisfactory, with no major breakdowns and a very satisfactory maintenance cost, and we have had no replacements of any major items of machinery or structure. And the conveyor belts proper are in excellent condition." Have a Link-Belt engineer give you the complete story.

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

10,286

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT